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FIG. 1A

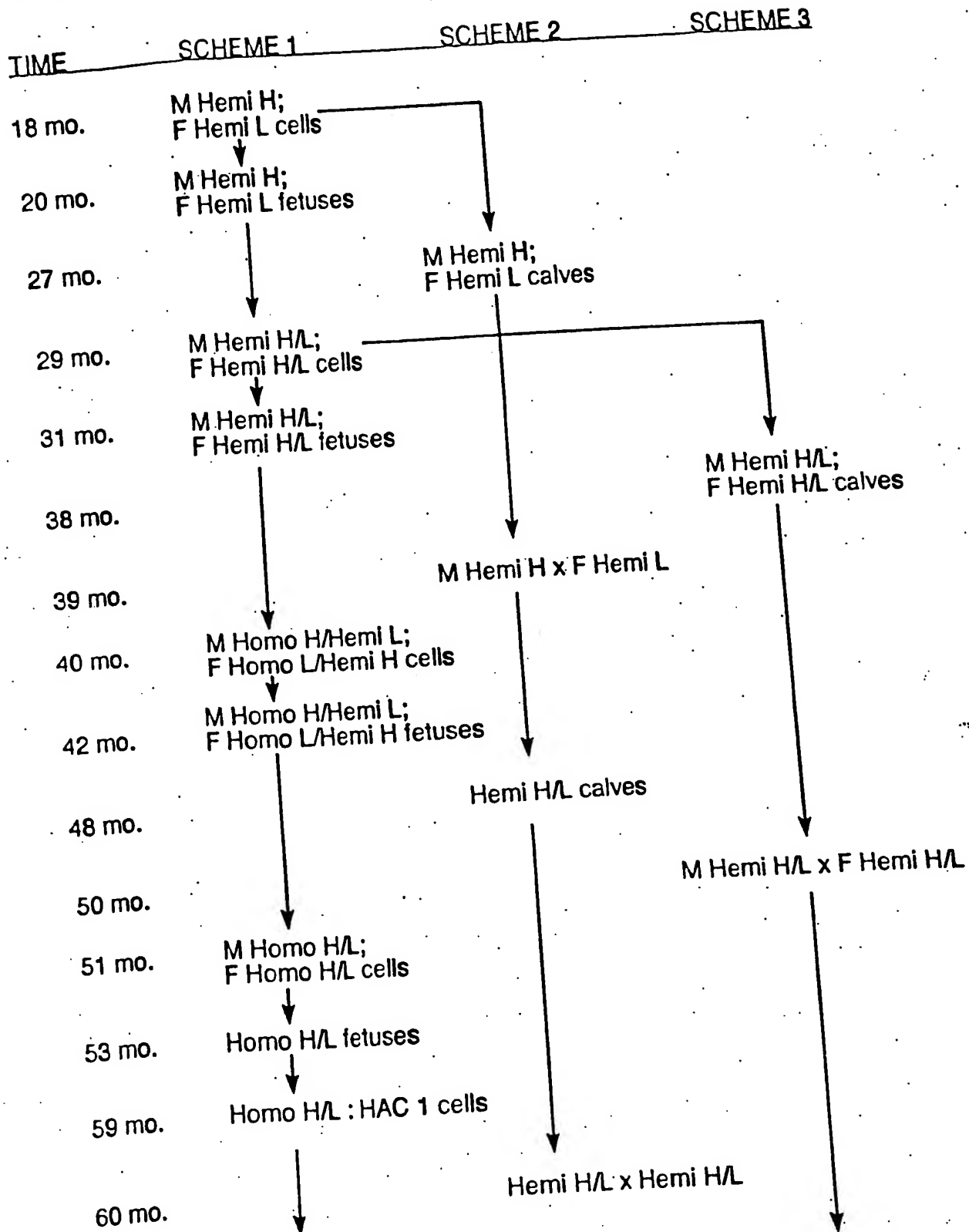


FIG. 1A (CONT.)

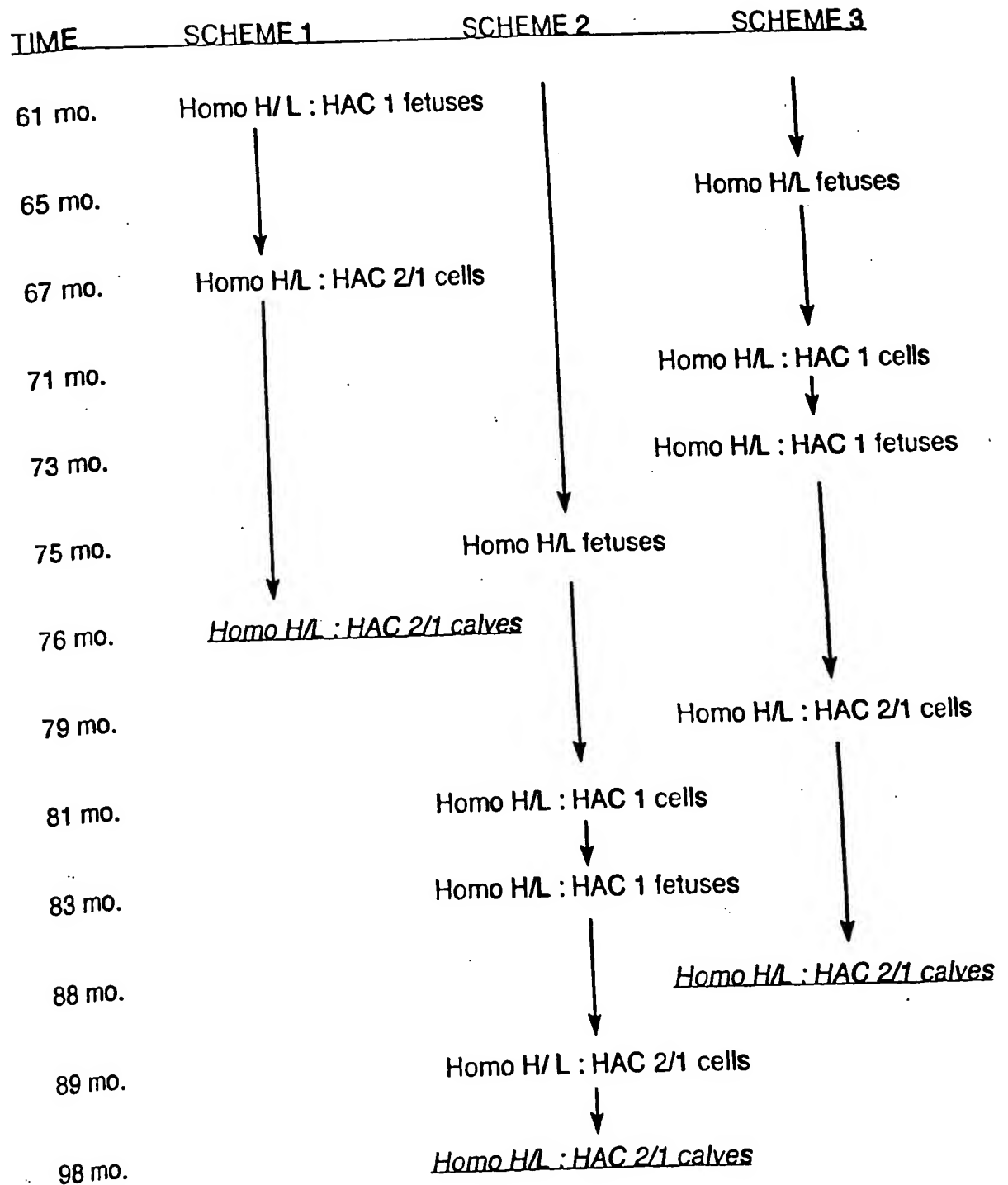


FIG. 1B

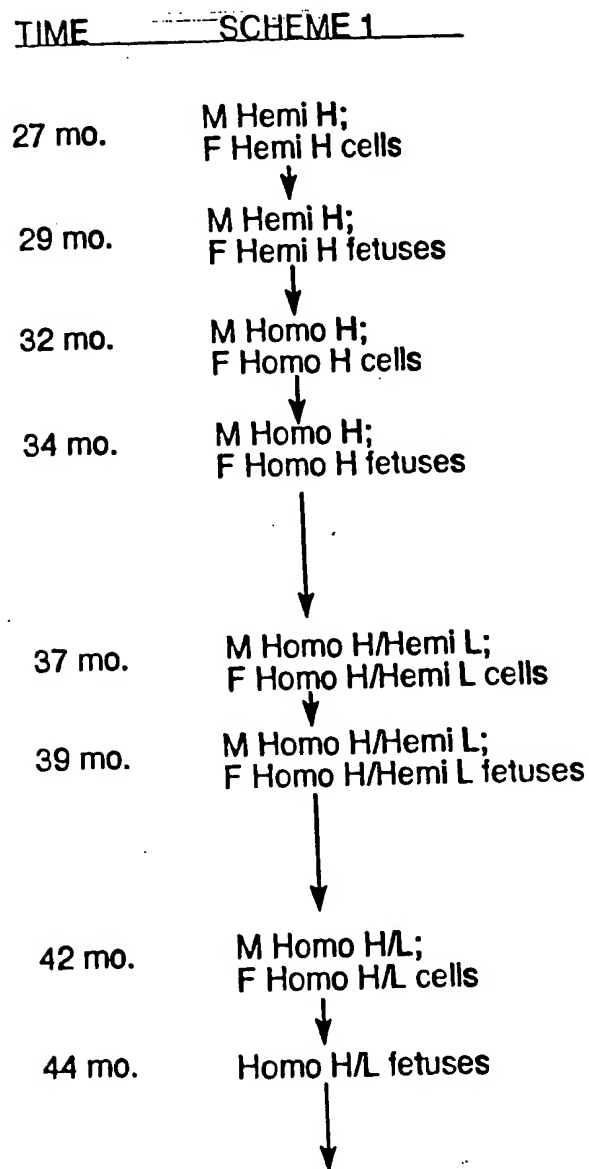


FIG. 1B (CONT.)

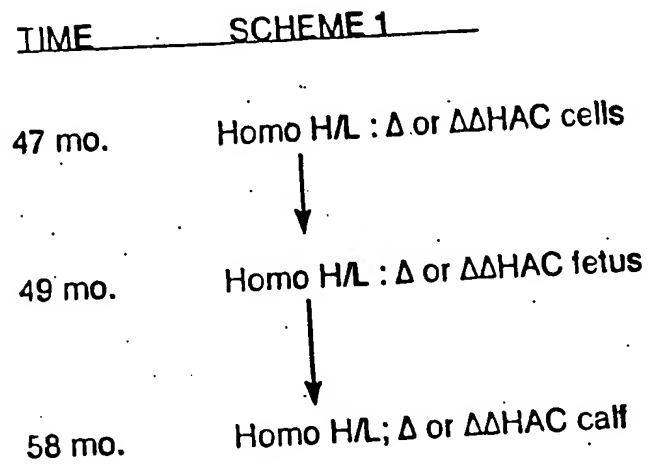


FIG. 2A

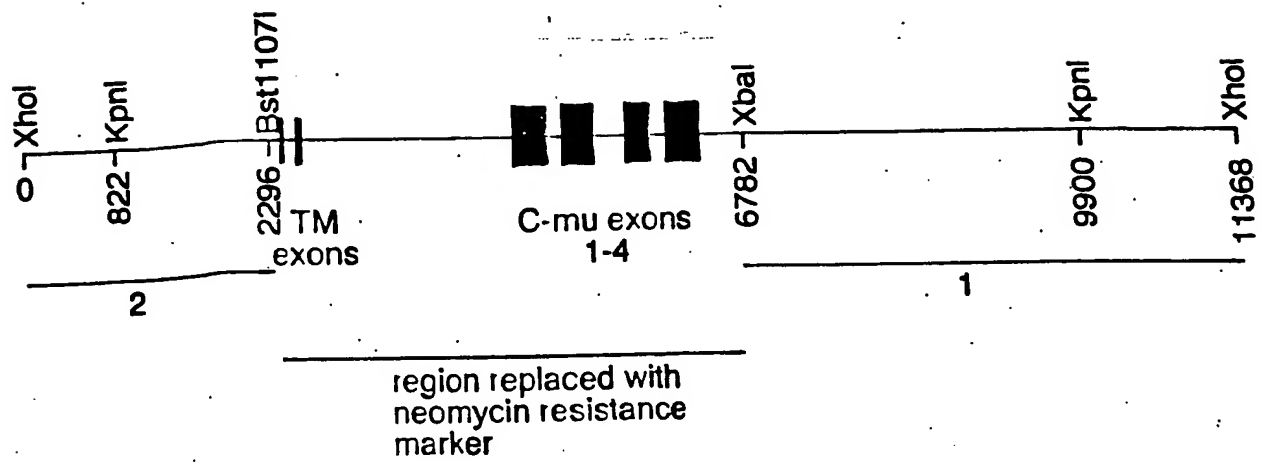


FIG. 2B

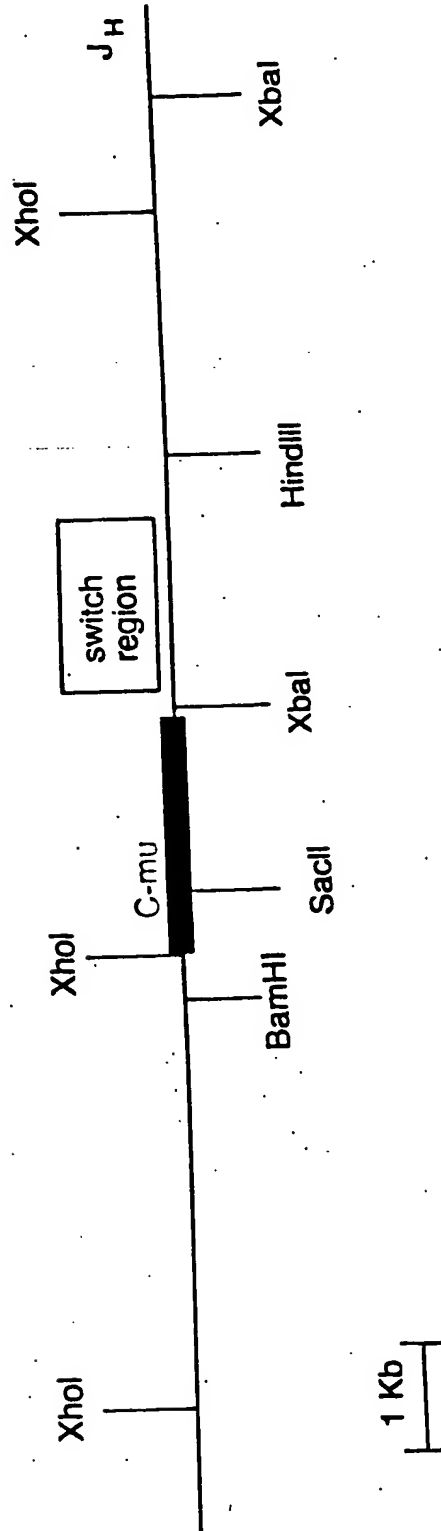


FIG. 3A

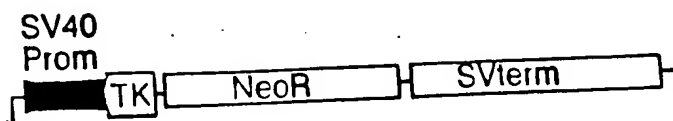


FIG. 3B

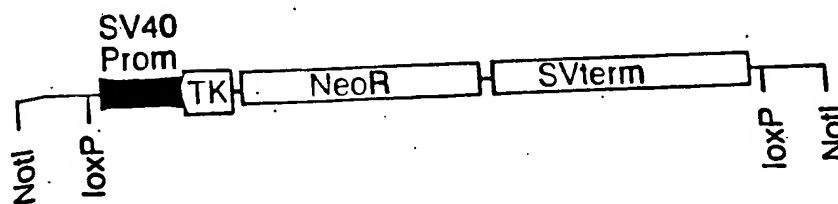


FIG. 3C

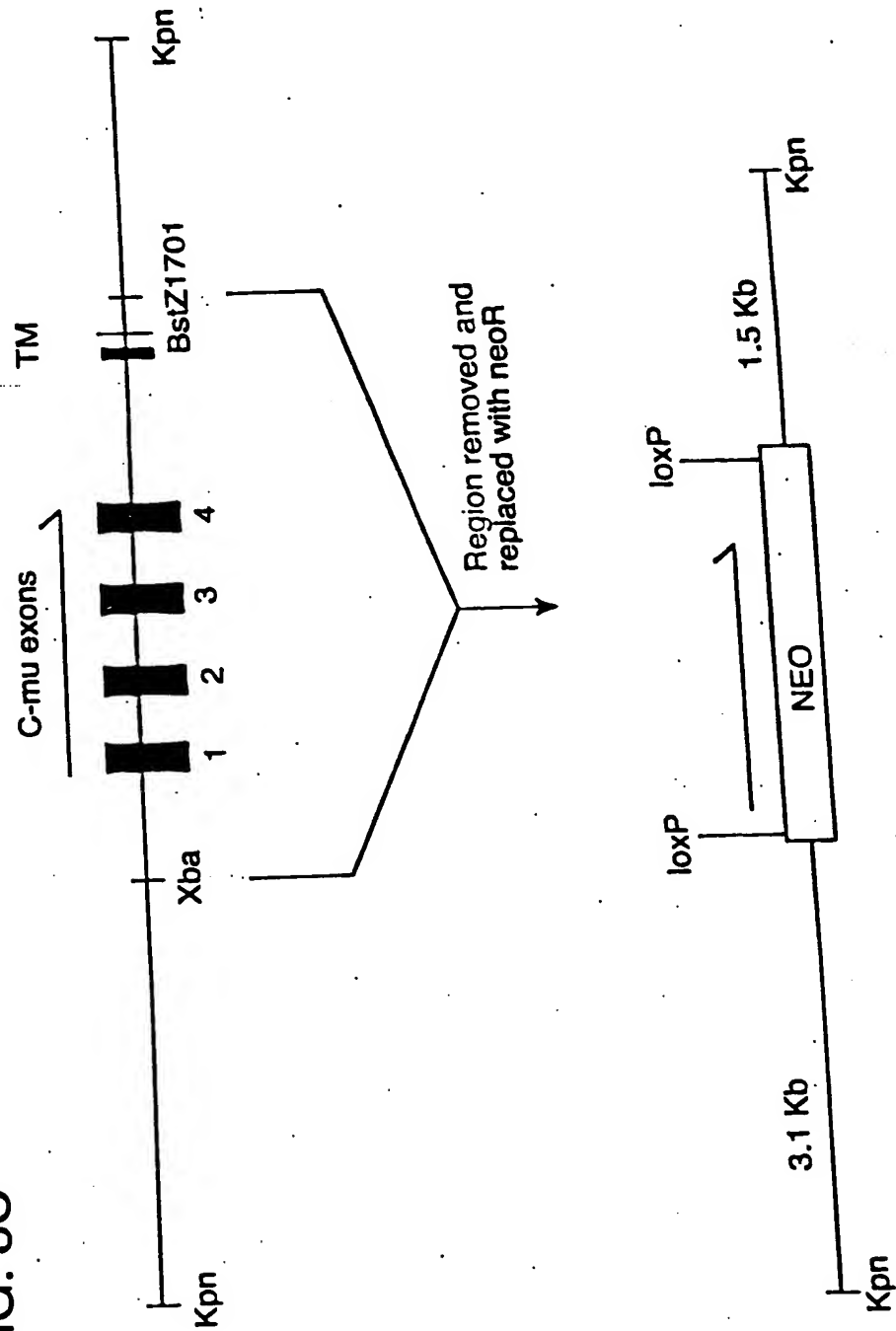


FIG. 3D

SEQ ID NO:47

GGTACCgaaaggCGGCCCTgaacattctgcagtgaggagccgcactgagaagctgcttcacgccgggaggagccagc
cagctacgattgtgagcacgctcacagtgccacggcatgtgcaggctcagcttaaccaccttgaaggagtaactcattaaag
agcgtacgaatgcattgataaaatgcacctgagacaaatlaattttaaaccatgacttggaaaatgaatataagtgagcagttgat
aggctctgaatgaaataaccttccaacagggtgctgagaaccgccaggagcagggaacggactccccgtggagccccagaagg
agccagccctgatgalacctggccccggccccctctcacgctgggagagagccagctccctgtgttcacgctggcctgtggtt
cttgtctcatggcccccaaacaggccacaggcttggcctgagtcctcggcctgcgtgcagccgccccctccccctgctgg
aggcaccctgacctggcgaggccccctcacccaacgttccccgcctgatgggttggccgcaaaggacaccgttaaccaga
actgcttccaggagccctactgctgggaggcggccttctctgggaccagggtccactccactcccttggatagtcactgtcaggcc
cttgggtggccccacaaggaggcgtcctgggaaggccccagctccttccagccccgtgaattgcttccctggagagccagatcac
ctcaccagctccccccccggccccagggtctcctcctccatcccaccgccaccctaccctggcggttgcctcacagctaa
cctgacctccctgggttcgagcgtgccggccgccccctgctggccccaccctggacccccgcagcctatctctgagggtatgc
ccctgtccccctgccccgtgccagctgccccctcttccaggccttctcctgctcctccagctcctgcacctccctgcagcttca
cctgagacttcccttccacctccaggcaccgtcttctggcctgcagggtgagggtctgcgctccctcaggggcacgatgtggctgca
cacacaccggccccctctccgagtccttctgcacacaccacgcgcacccgagggtgacaagccccgtccgtgggtgggatcc
gggaatggcggcagagaggggcgggggtgtccttggggctgtggcagggtctcatggatgcacacagcggccccggctc
aggccaccttgggaaaccagtcctgggactgcaactcggccatgttcttgcacttgaccagccccaaagacaccacccggc
gtggcggcacgtggcctgggaggagacacatgtcccttccatcagcaatgggttcagcactaggatatgcagcacacaggag
tggtgttgggggtaaaaaaccttccagagggaagcgttccacaaaaataaagta

FIG. 3E

SEQ ID NO: 48

[illegible]

FIG. 3F

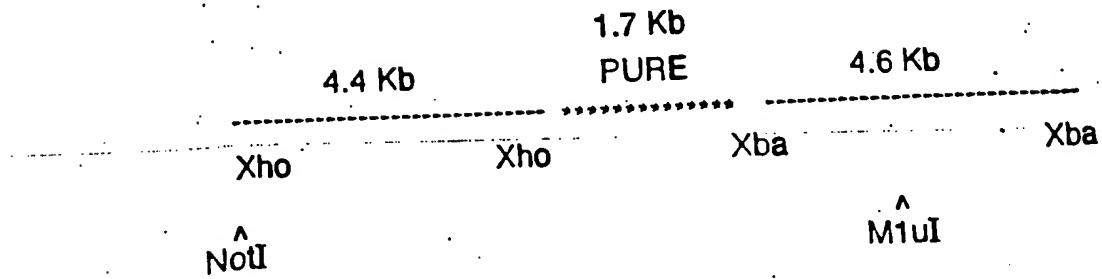


FIG. 3G

SEQ ID NO: 60

1 atgagatcc ctgcicagct cctggggctc ctctgctct gggtcccagg
51 atccagtgagg gatgtgtgc tgaccagac tccccctcc ctgctatca
101 tccctggaga gacggctcc atctctgca agtctacta gagtctgaaa
151 tatagtgat gaaaaaccta mgtactgg ctcaacata aaccaggcca
201 atcaccacag ctgtgatct atgtgttc cagccgtac actggggctc
251 cagacaggt cactggcagt gggcagaaa cagattcac acttacgatc
301 aacagtgtc aggtgagga tgtggagtc tatctgtc tcaaacaaac
351 atatgtcca aatacttcg gccaaaggaa caaggtagag atcaaaagg
401 ctgatgtga gccatcgtc tcccttca aaccatctga tgagcagctg
451 aagaccgaa ctgtctgt cgtgtgtg gtgaatgatt tctaccccaa
501 agatatcaat gtcaagtga aagtggatgg ggtactcag agcagcagca
551 acttcaaaa cagttcaca gaccaggaca gcaagaaaag cacctacagc
601 ctacagcga tctgacact gccagctca gatlacaaa gccatgacgc
651 ctatcgtgt gaggtcagcc acaagagcct gactaccacc ctgtcaaga
701 gcttcagtaa gaacgagtgt tag

FIG. 4

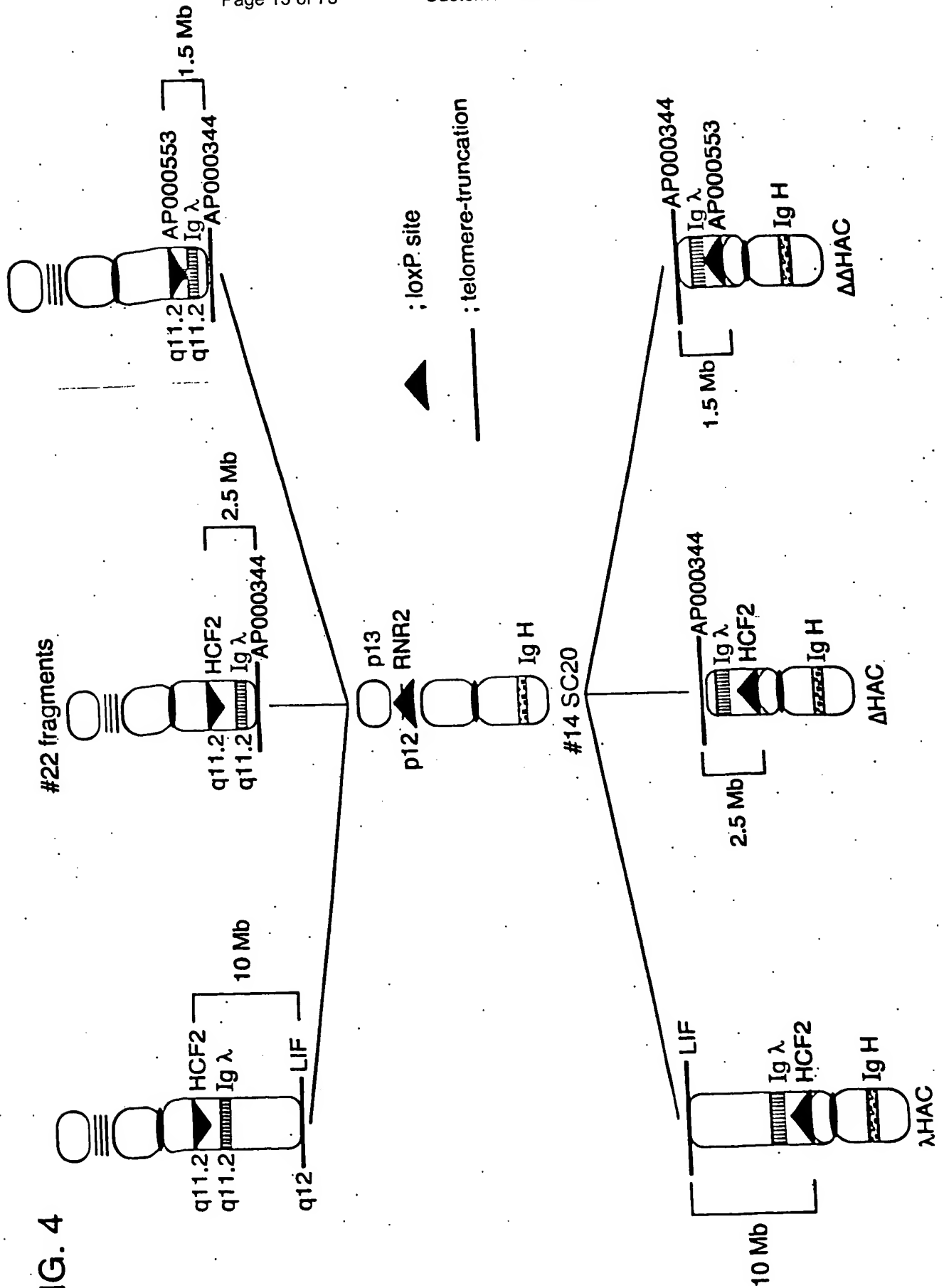
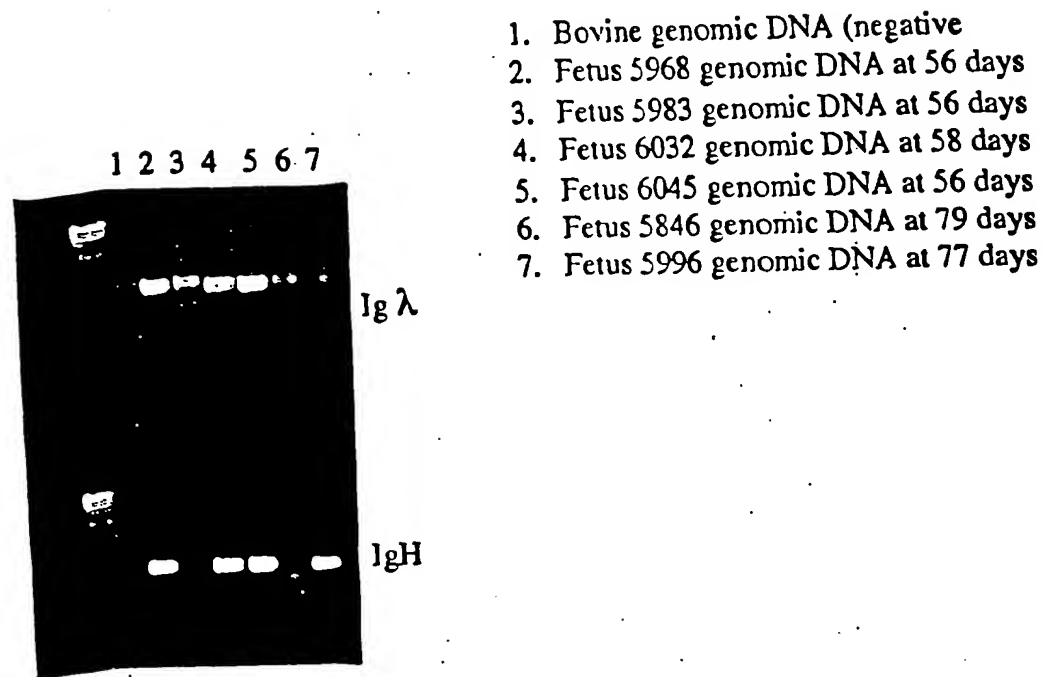
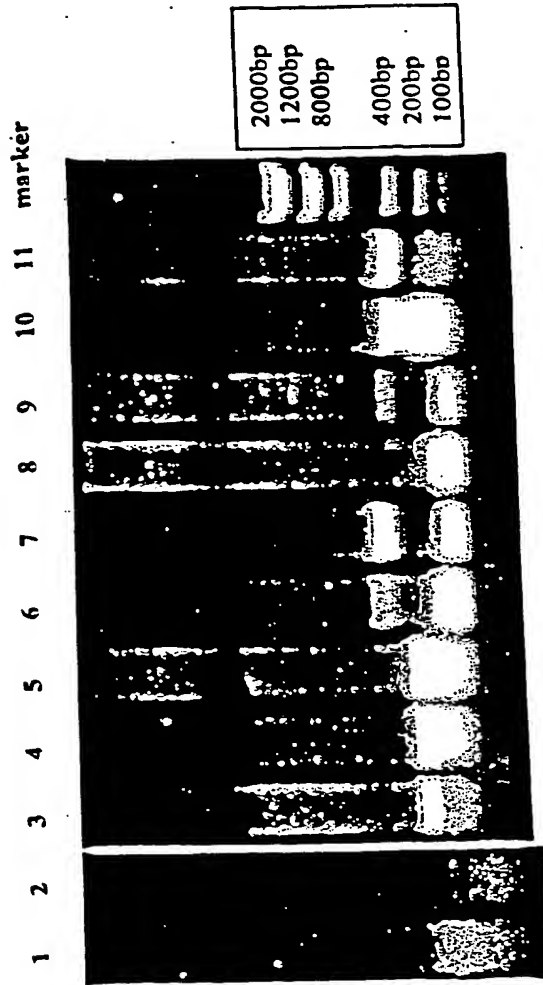


FIG. 5



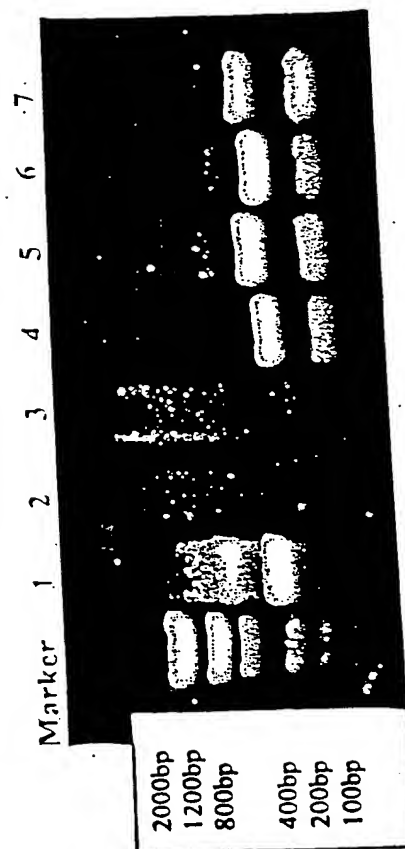
Fetus	Clone	IgH	Ig λ
5968	B4-2	Pos	Pos
5983	B2-13	Neg	Neg
6032	B4-8	Pos	Pos
6045	B2-22	Pos	Pos
5846	B4-8	Neg	Neg
5996	B4-2	Pos	Neg

FIG. 6



1. Human mu constant region in bovine liver cDNA from fetus 5996.
2. Human mu constant region in bovine brain cDNA from fetus 5996.
3. Human mu constant region in bovine spleen cDNA from fetus 5996.
4. Human mu constant region in human spleen cDNA.
5. Human mu constant region in mouse spleen cDNA with HAC.
6. Bovine rearranged Cmu heavy chain in bovine spleen cDNA from fetus 5996.
7. Bovine rearranged Cmu heavy chain in human spleen cDNA.
8. Bovine rearranged Cmu heavy chain in mouse spleen cDNA with HAC.
9. GAPDH primers in bovine spleen cDNA from fetus 5996.
10. GAPDH primers in bovine liver cDNA
11. GAPDH primers in mouse spleen cDNA with HAC.

FIG. 7



1. GAPDH primers in bovine liver cDNA
2. Bovine rearranged Cmu heavy chain in bovine brain cDNA from fetus 5996.
3. Bovine rearranged Cmu heavy chain in bovine liver cDNA from fetus 5996.
4. GAPDH primers in bovine spleen cDNA from fetus 5996.
5. Bovine rearranged Cmu heavy chain in bovine spleen cDNA from fetus 5996.
6. GAPDH primers in bovine brain cDNA from fetus 5996.
7. Bovine rearranged Cmu heavy chain positive control.

FIG. 8

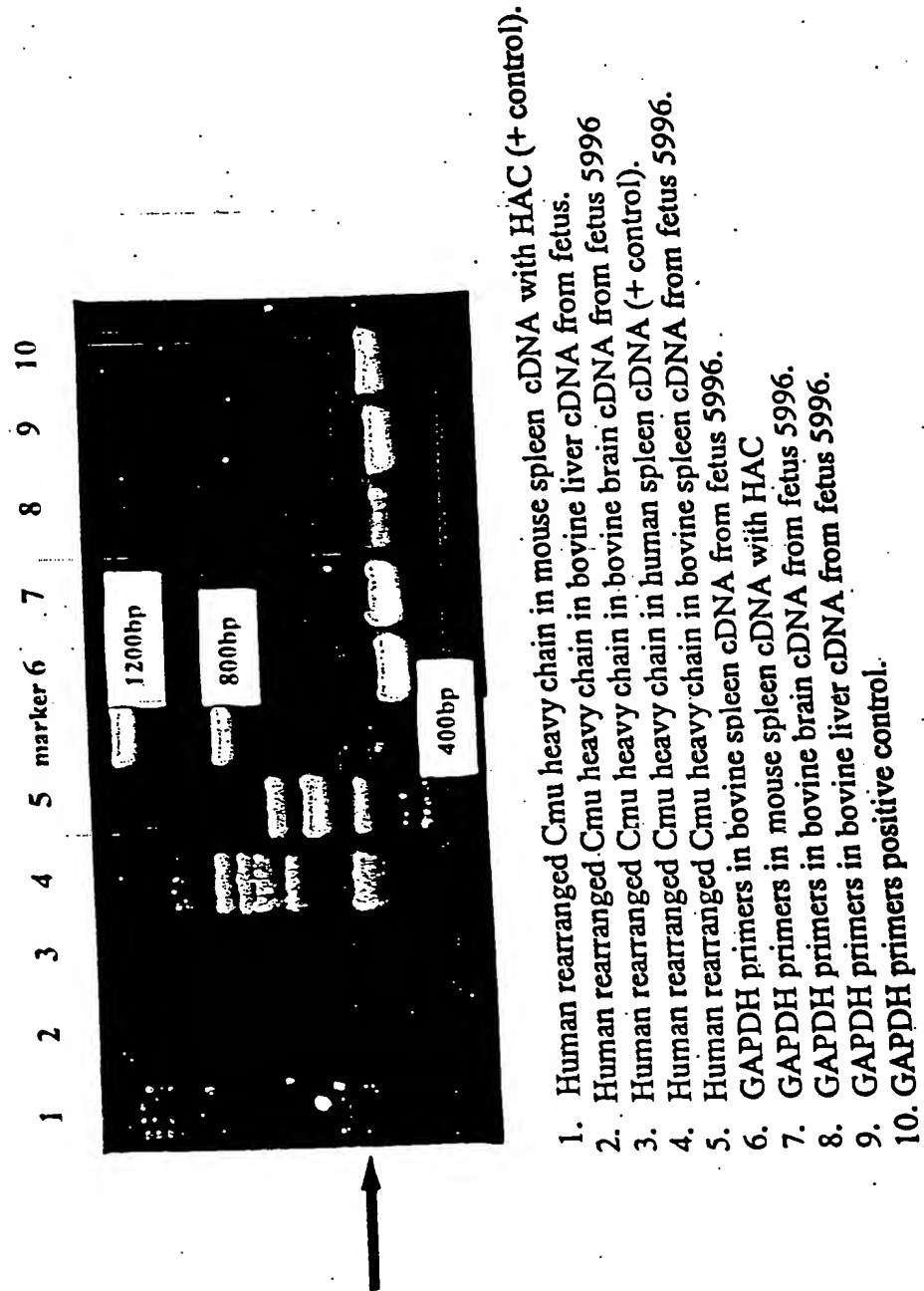


FIG. 9

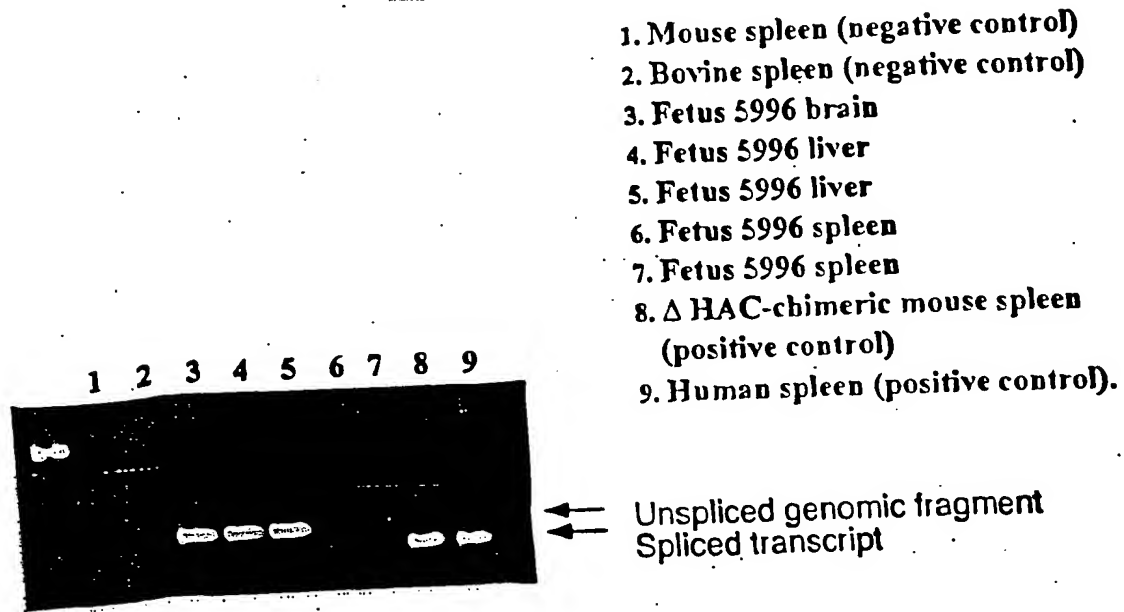
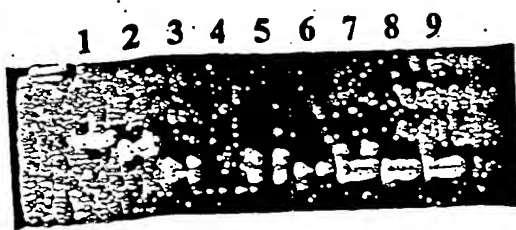


FIG. 10



1. Mouse spleen (negative control)
2. Bovine spleen (negative control)
3. Fetus 5996 brain
4. Fetus 5996 liver
5. Fetus 5996 liver
6. Fetus 5996 spleen
7. Fetus 5996 spleen
8. Δ HAC-chimeric mouse spleen
(positive control)
9. Human spleen (positive control)

FIG. 11A

SEQ ID NO: 49

5'
GGGAAGGAAAGTCCTGTGGGACCANCCAACGGGCAAGCTGCTCGTATCCGACG
GGGAATTCTCACAGGAGACGAGGGGGAAAAGGGTTGGGGCGGATGCACTCC
CTGAGGAGACGGTGACCAGGGTTCCNTGGGCCACGNNGTCAA3'

FIG. 11B

SEQ ID NOs: 50 and 51

V-D-J region

→ constant mu region

Subject: 5'

tttgactactggggccagggaaccctggtcaccgtctcctcagggagtgcatccgccccca
-----nn-----n-----

Query

Subject:

acccttttccccctcgtctcctgtgagaattccccgtcggatacagagcagcgtggccggtt

Query

Subject: 5'

ggctgcctcgcacaggacttccttcccgactccatcactttctectg 3'

--n--g----- Cmul primer

FIG. 12A

SEQ ID NOs: 52 and 53

55
 19 46 37 28 10 19 55
 5' GGA GGCTTG GTC AAG CCT GGA GGG TCC CTG AGA CTC TCCTGT GCA GCCTCTT GGA
 G G L V K P G G S L R L S C A A S G

109
 64 73 82 91 100 109
 TTCACCTTCAGT GACTACTACATGAGCTGGATCCGCCAGGCTCCA GGG AAG GGG
 P T F S D Y Y M S W I R Q A P G K G

163
 118 127 136 145 154 163
 CTGGAGTGG GTT TCA TAC ATT AGT AGT GGT AGT ACC ATA TACTAC GCA GAC
 L B W V S Y I S S S G S T I Y Y A D

217
 172 181 190 199 208 217
 TCTGTG AAG GGCCGA TTC ACC ATCTCCAGG GACAAC GCC AAG AACTCA CTGTAT
 S V K G R F T I S R D N A K N S L Y

271
 226 235 244 253 262 271
 CTGCAA ATG AACAGC CTG AGA GCC GAG GAC ACG GCT GTG TAT TACTGT GCG AGA
 L Q M N S L R A E D T A V Y Y C A R

325
 280 289 298 307 316 325
 ATA ACT GGG GAT GCT TTT GAT ATCTGG GGC CAA GGG ACA ATG GTC ACC GTC TCT
 I T G D A F D I W G Q G T M V T V S

379
 D7-27 334 343 352 361 370 379
 TCA GGG ACT GCA TCC GCC CCA ACC CTT TTT CTT CTC GTC TCC TGT GAG AAT TCC
 S G S A S A P T L F P L V S C B N S

388
 388
 CCCTCG GAT ACG AGC 3'
 P S D T S

Cμ

FIG. 12B

SEQ ID NOS: 54 and 55

5' GTG GAG TCT GGG OGA GGC TTG GTA CAG CCT GGG AGG TCC CTG AGA CTC TCC TGT
V B S O O O L V Q P G R S L R L S C

OCA GCG TCA GGA TTC ACC TTC ACG AAC TTG GGC ATG CAC TGG GTC CGC CAG GCT
A A S G F T P R N P G M H W V R Q A

CCA GGC AAG GGG CTG GAG TGG GTG ACA GTT ATA TGG TAT GAC GGA AGT AAT CAA
P G K G L E W V T V I W Y D G S N Q

TACTAT ATA GACTCC GTG AAG GGC CGA TTC ACC ATC TCC AGA GAC AAT TCC AAG
Y Y I D S V K G R F T I S R D N S K

AAC ATG TTG TAT CTG CAA ATG AAC AGC CTG AGA GCC GAG GAT ACG GCT GTG TAT
N M L Y L Q M N S L R A B D T A V Y

TACTGT GCG AGA GAT CGC AAT GGC CTG AAG TACT TCG ATC CTG GGC CGT GGC
Y C A R D R N G L K Y F D L W G E G

ACC CTG GTC ACT GTC TCA TCA GGG AGT GCA TCC GTC CCA ACC CTG TTT TTT TTT TTT
T L V T V S S G S A S A P T L P P L

GTCTTC TGT GAG AAT TCC CCG TCG GAT ACG AGC J
V S C E N S P S D T S

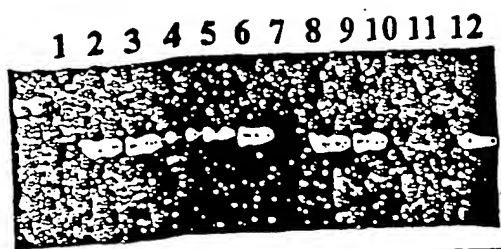
VH3-33

D6-39 ? N addition

JH2

Cμ

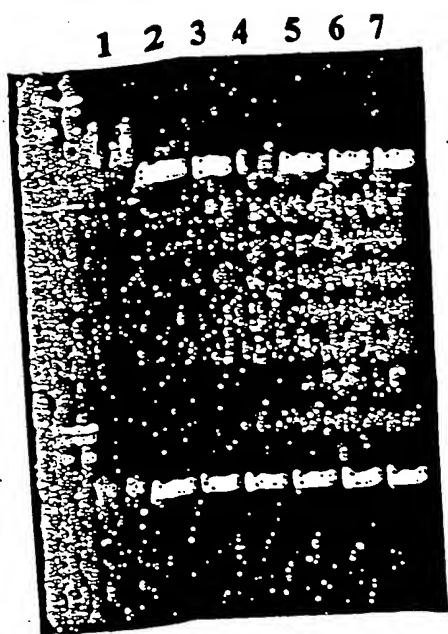
FIG. 13



Fetus	Clone	IgH	Igλ
5580	412	Pos	Pos
5848	214	Neg	Neg

1. Bovine genomic DNA (negative control)
2. Fetus 5580 genomic DNA (Igλ)
3. Fetus 5580 genomic DNA (Igλ)
4. Fetus 5848 genomic DNA (Igλ)
5. Fetus 5848 genomic DNA (Igλ)
6. Positive control (Human genomic DNA)
7. Bovine genomic DNA (negative control)
8. Fetus 5580 genomic DNA (IgH)
9. Fetus 5580 genomic DNA (IgH)
10. Fetus 5848 genomic DNA (IgH)
11. Fetus 5848 genomic DNA (IgH)
12. Positive control (Human genomic DNA)

FIG. 14



IgH

1. Bovine genomic DNA (negative control)
2. Fetus 5442A genomic DNA (91 day)
3. Fetus 5442A genomic DNA (91 day)
4. Fetus 5442B genomic DNA (91 day)
5. Fetus 5442B genomic DNA (91 day)
6. Fetus 5968 genomic DNA (56 day; positive control)
7. Human genomic DNA (positive control)

Igλ

FIG. 15

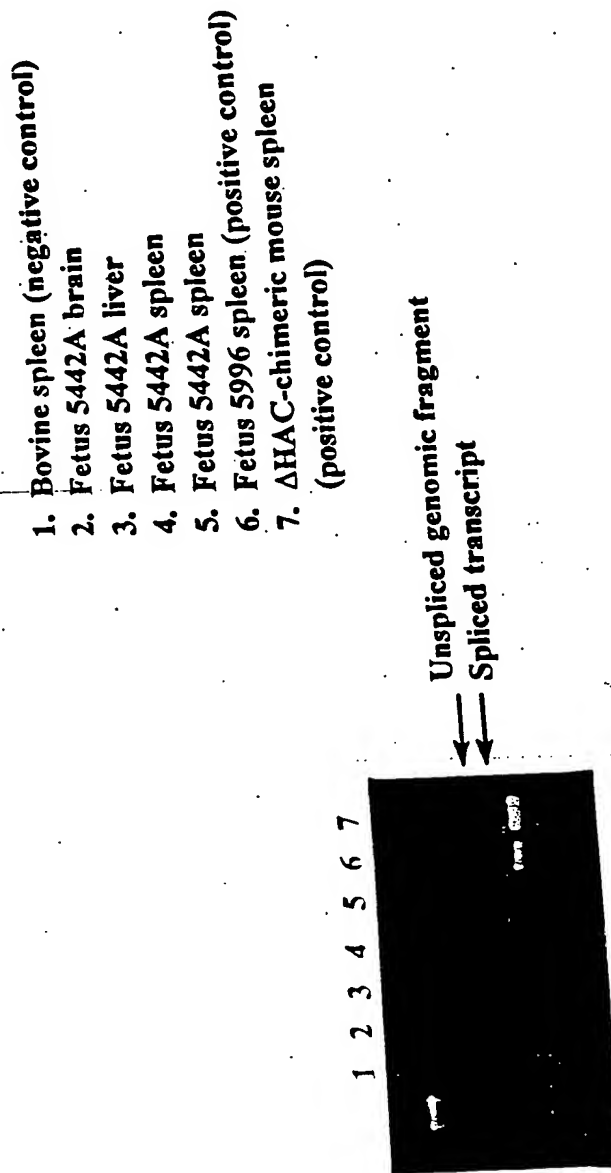
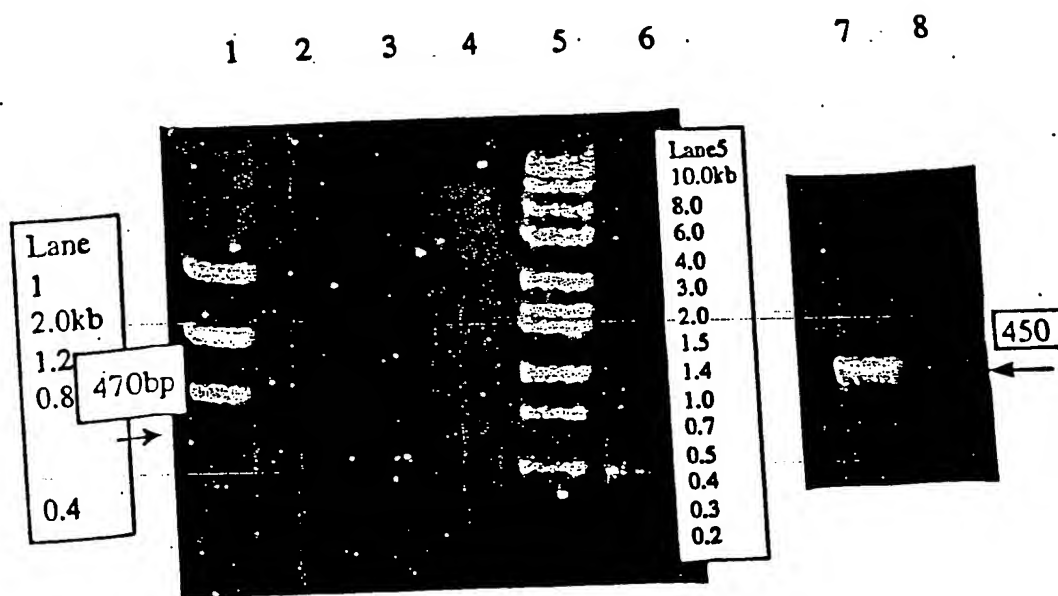


FIG. 16



1. Low Mass Ladder: 2.0, 1.2, 0.8, 0.4, 0.2
0.1kb

2. Normal Bovine spleen cDNA negative

3. $\Delta\Delta$ HAC 5868A spleen

4. empty

5. Hi Lo

0.2, 0.1kb

6. Tc Mouse HAC spleen cDNA positive

7. GAPDH product from 5868A spleen cDNA

8. GAPDH product from normal bovine
cDNA

FIG. 17

1. Bovine spleen (negative control)
2. Fetus 5442A brain
3. Fetus 5442B brain
4. Fetus 5442A liver
5. Fetus 5442B liver
6. Fetus 5442A spleen
7. Fetus 5442A spleen
8. Fetus 5442B spleen
9. Fetus 5442B spleen
10. Δ HAC-chimeric mouse spleen (positive control)



FIG. 18

1. Bovine spleen (negative control)
2. Fetus 5442A brain
3. Fetus 5442A liver
4. Fetus 5442A spleen
5. Fetus 5442A spleen
6. Δ HAC-chimeric mouse spleen (positive control)



FIG. 19

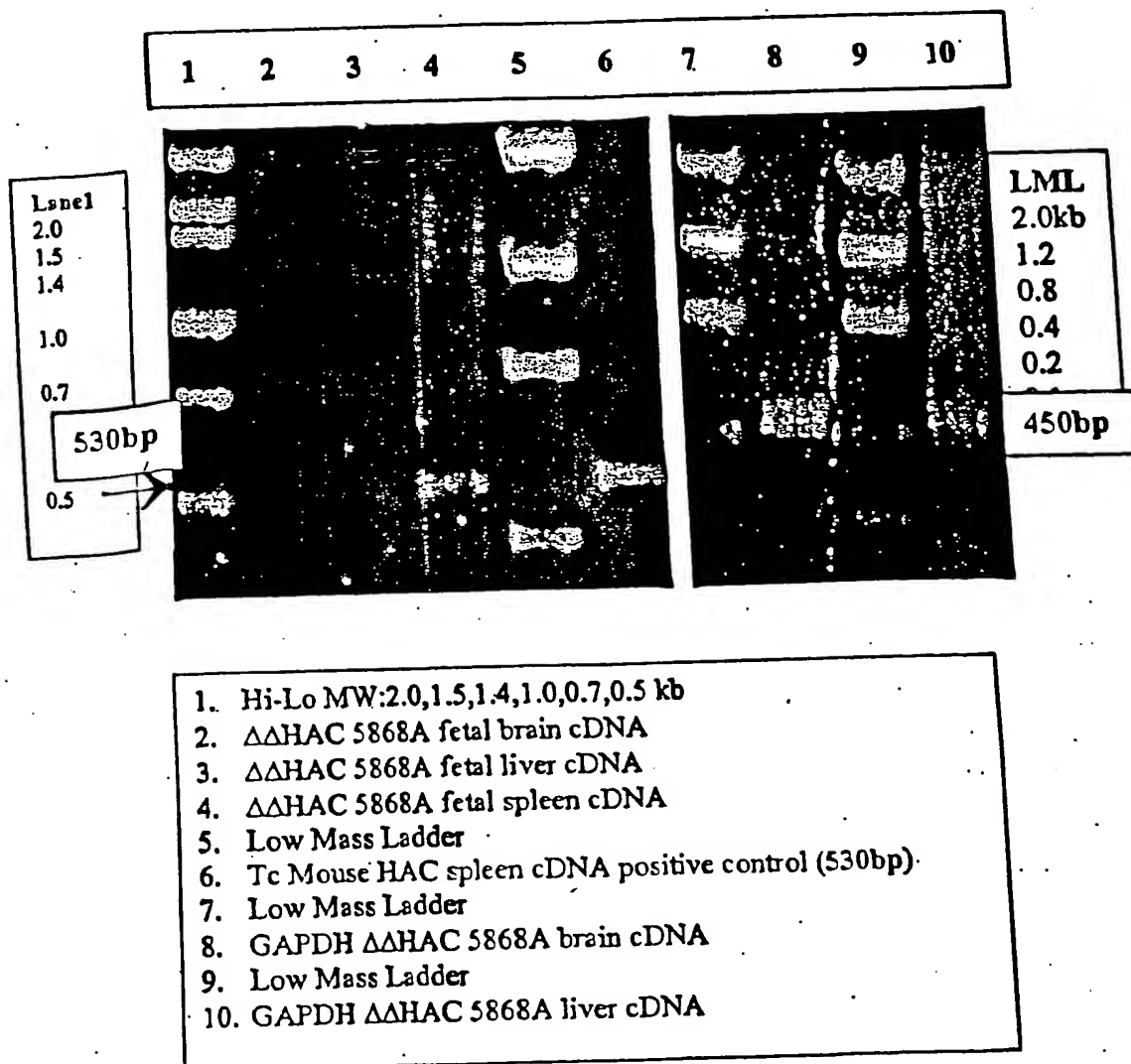


FIG. 20

SEQ ID NOs: 56 and 57

```
5' ACC CTC CTC ACT CAC TGT GCA GGG TCCTGG GCC CAG TCT GTG CTG ACT CAG CCA  
T L L T H C A G S W A Q S V L T Q P  
CCCTCA GCG TCT GGG ACC CCC GGG CAG AGG GTC ACC ATC TCT TGT TCT GGA AGC  
P S A S G T P G Q R V T I S C S G S  
AGCTCC AAC ATC GGA AGT AATTAT GTA TACTGG TACCAG CAG CTC CCA GGA ACG  
S S N I G S N Y V Y W Y Q Q L P G T  
GCC CCC AAA CTC CTC ATC TAT AGG AAT AAT CAG CGG CCCTCA GGG GTC CCT GAC V1-17  
A P K L L I Y R N N Q R P S G V P D  
CGA TTC TCT GGCTCC AAG TCT GGC ACCTCA GCC TCC CTG GCC ATC AGT GGG CTC  
R F S G S K S G T S A S L A I S G L  
CCG TCC GAG GAT GAG GCT GAT TAT TACTGT GCA GCA TGG GAT GAC AGC CTG AGT  
R S E D E A D Y Y C A A W D D S L S  
GGT CTT TTC GGC GGA GGG ACC AAG CTG ACC GTC CTA GGT CAG CCC AAG GCT GCC  
G L F G G G T K L T V L G Q P K A A  
CCCTCG GTC ACT CTG TTC CCA CCC TCC TCT GAG GAG CTT CAA GCC AAC AAG GCC  
P S V T L F P P S S E E L Q A N K A  
JL3  
ACA CTG GTG 3'  
T L V
```

FIG. 21

SEQ ID NOs: 58 and 59

5' AGT TGG ACC CCT CTCTGG CTC ACT CTC TTC ACT CTT TGC ATA GGT TCT
S W T P L W L T L P T L C I G S

GTG GTT TCT TCT GAG CTG ACT CAG GAC CCT GCT GTG TCT GTG GCC TTG GGA CAG
V V S S E L T Q D P A V S V A L G Q

ACA GTC AGG ATC ACA TGC CAA GGA GAC AGC CTC AGA AGC TAT TAT GCA AGC TGG
T V R I T C Q G D S L R S Y Y A S W

TACCAGCAG AAG CCA GGA CAG GCC CCT GTA CTT GTC ATCTAT GGT AAA AAC AAC V2-13
Y Q Q K P G Q A P V L V I Y G K N N

CGG CCCTCA GGG ATC CCA GAC CGA TTCTCT GGCTCC AGCTCA GGA AAC ACA GCT
R P S G I P D R F S G S S G N T A

TCC TTG ACC ATC ACT GGG GCT CAG GCG GAA GAT GAG GCT GACTAT TACTGT AAC
S L T I T G A Q A E D E A D Y Y C N

TCC CGG GAC AGC AGT GGT AAC CAT CTG GTA TTC GGC GGA GGG ACC AAG CTG ACC JL2
S R D S S G N H L V F G G G T K L T

GTC CTA GGT CAG CCC AAG GCT GCC CCC TCG GTC ACT CTG TTC CCA CCC TCC TCT
V L G Q P K A A P S V T L F P P S S

GAG GAG CTT CAA GCC AAC AAG GCC ACA CTG GTG 3'
E E L Q A N K A T L V CA

FIG. 22A

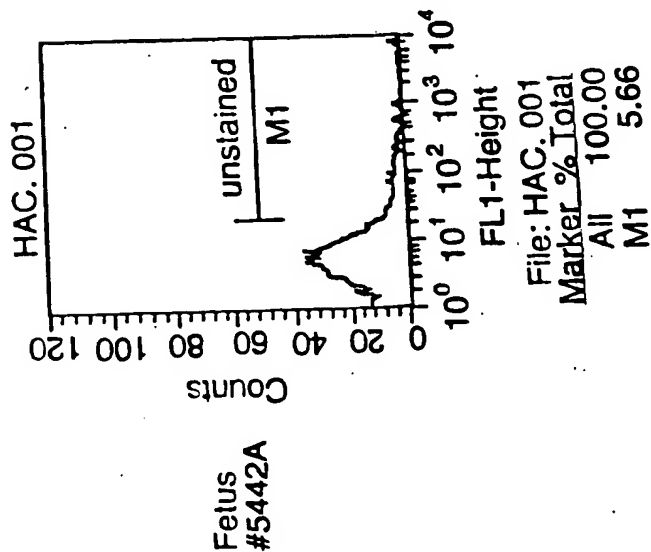


FIG. 22B

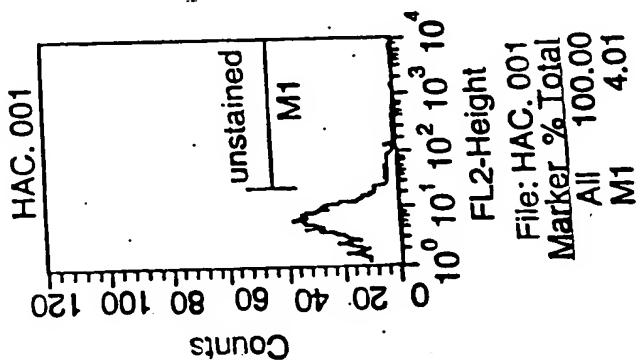


FIG. 22C

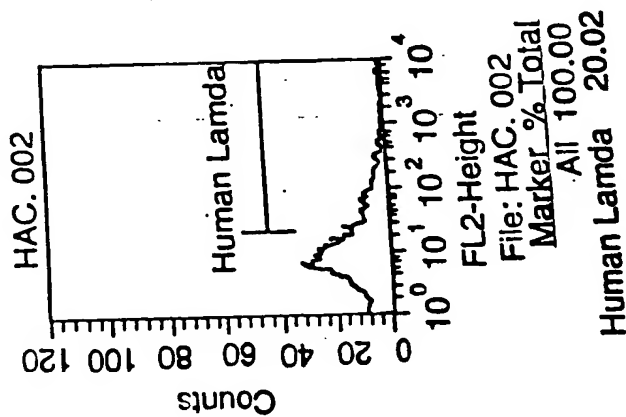


FIG. 22D

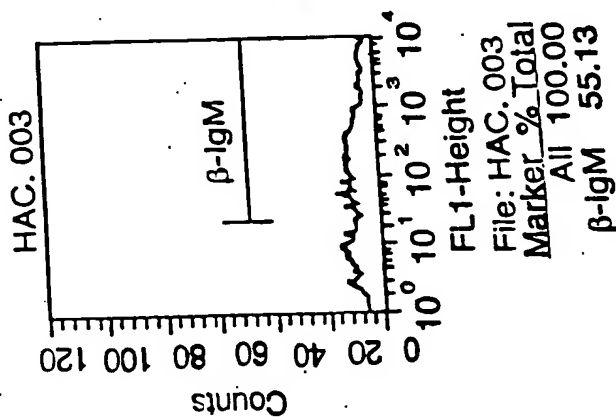


FIG. 22E

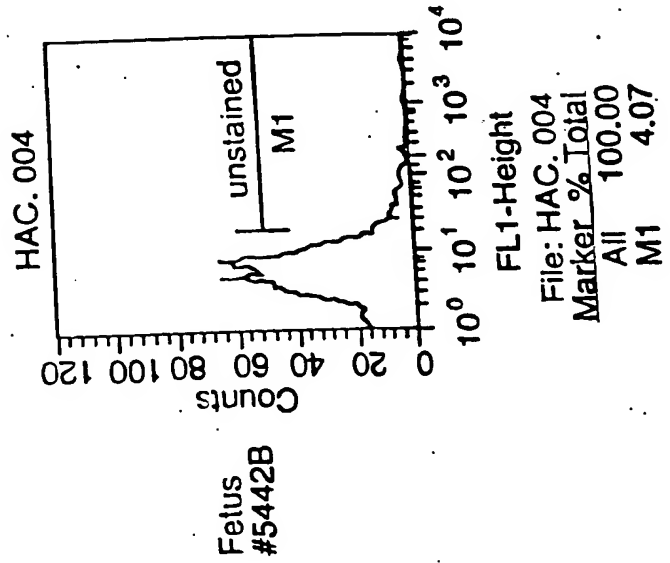


FIG. 22F

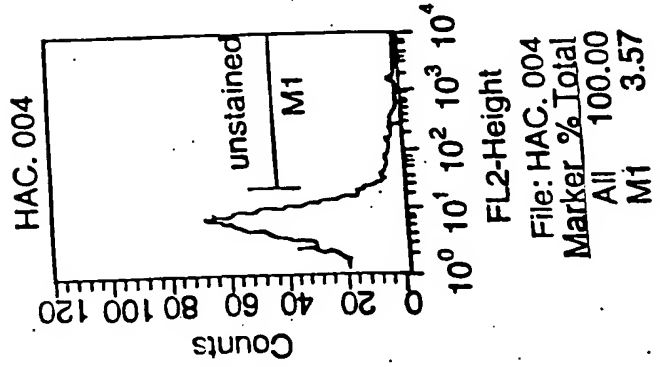


FIG. 22G

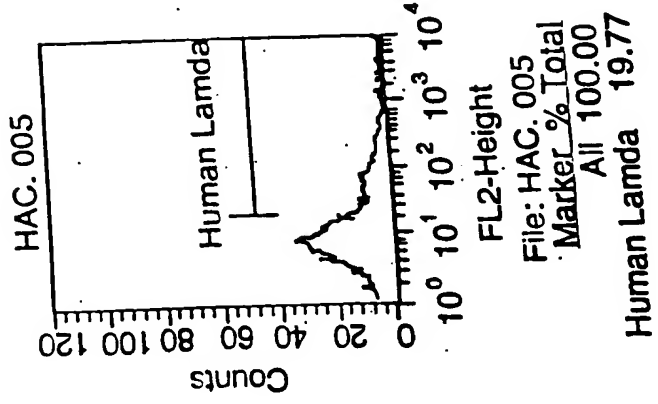


FIG. 22H

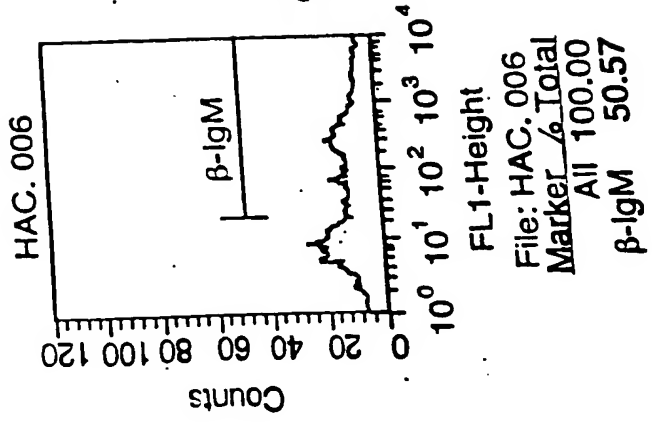


FIG. 23

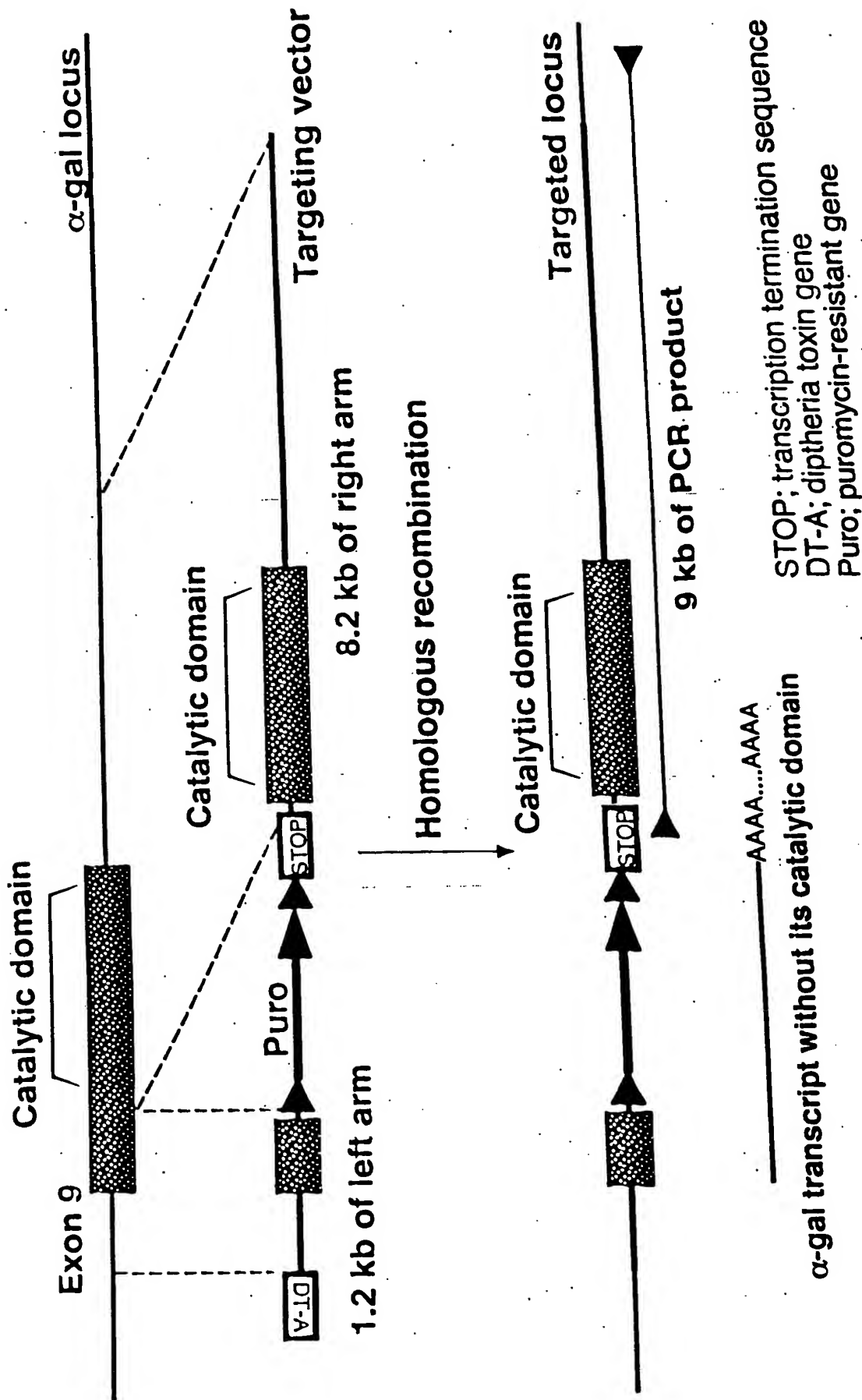
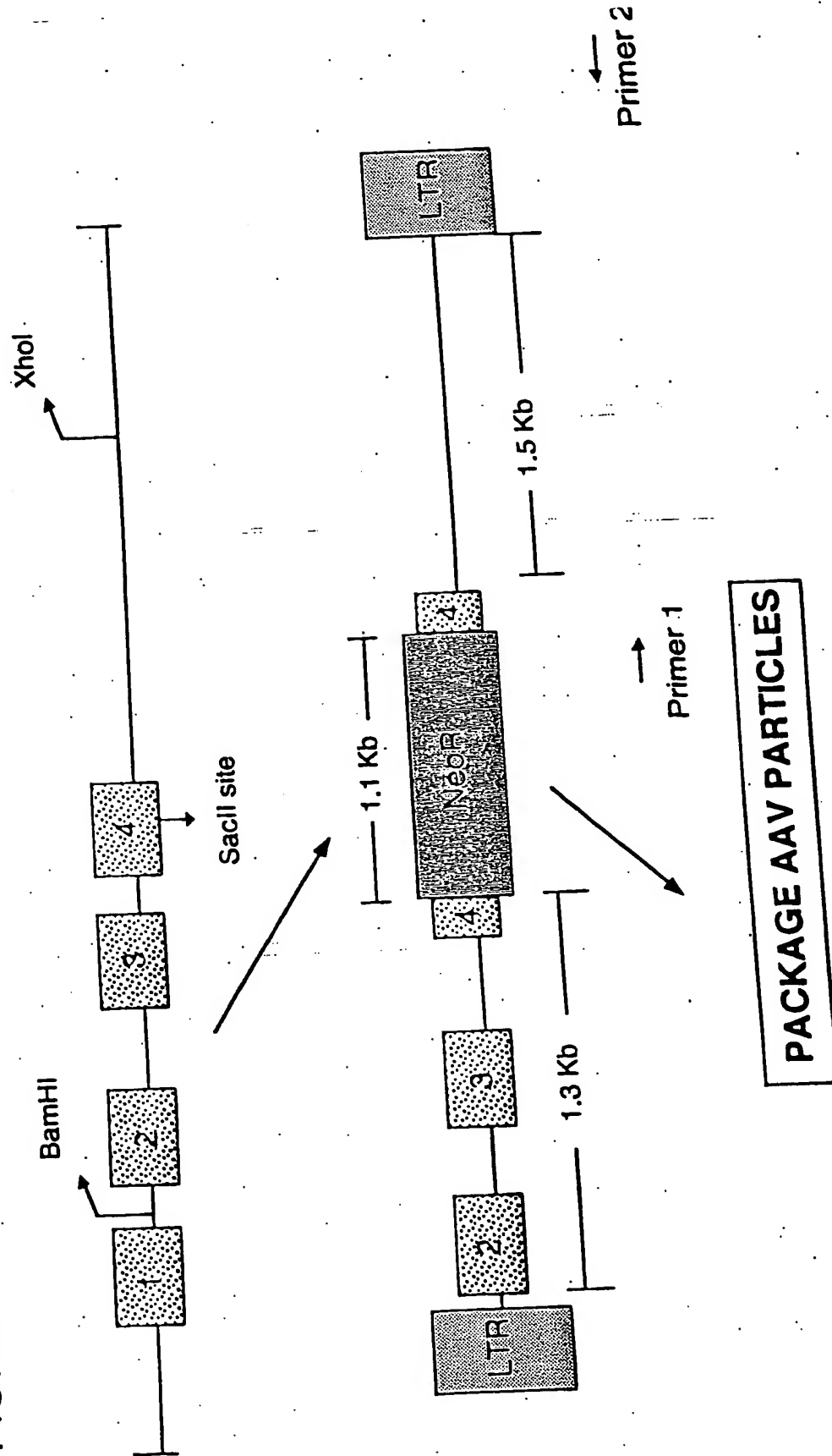


FIG. 24



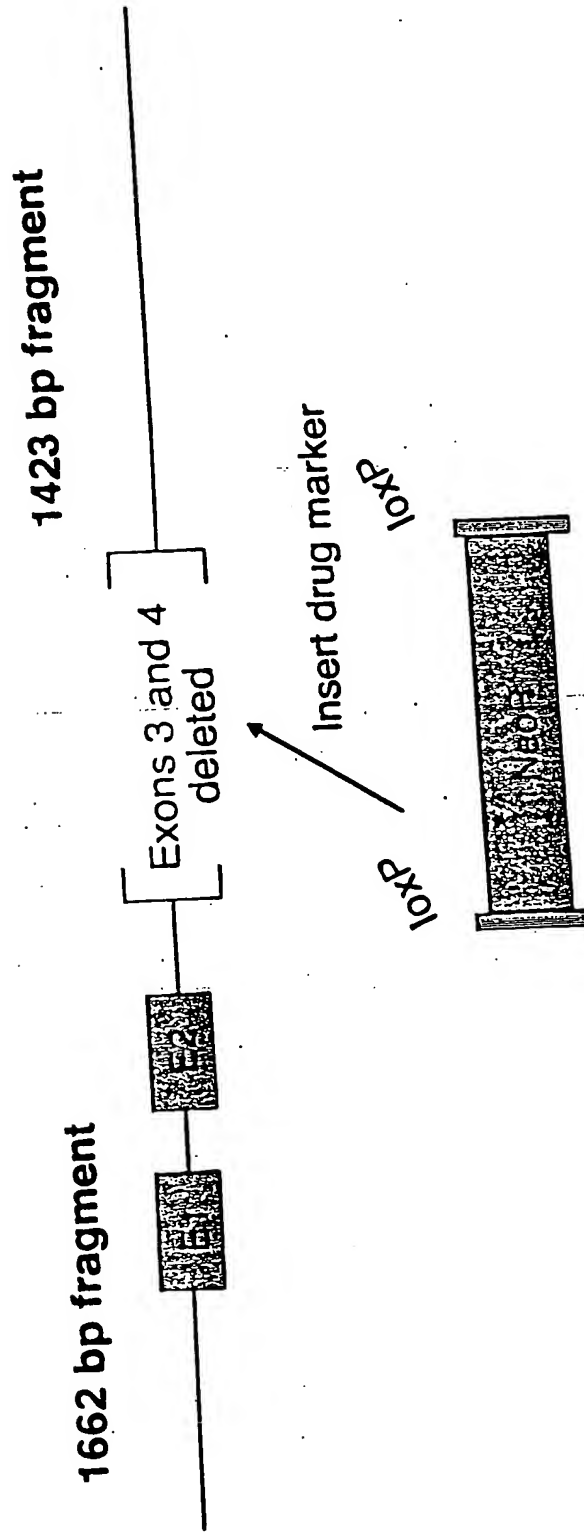


FIG. 26

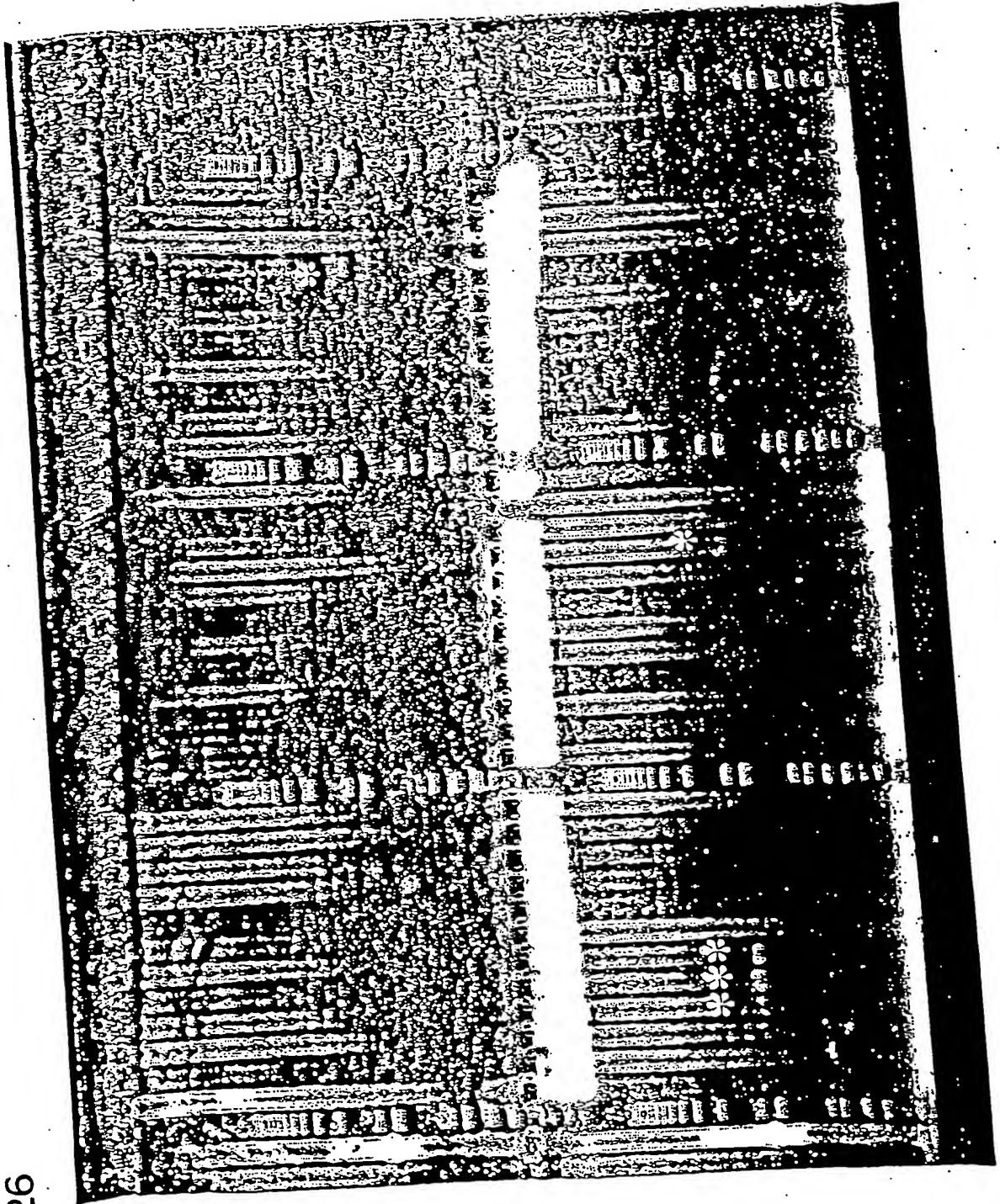
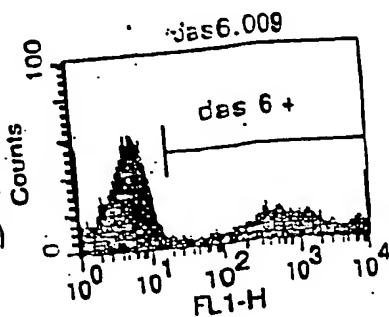


FIG. 27

NT, ET and pregnancies : Delta HAC regenerated fibroblasts											
Cell line	Total NTs	No of Blast	No of Blast	Pregnancy status							
ID	In culture	(%)	Transferred	No Recios	40 d	60 d	90 d	120 d	150 d	180 d	210 d
D5968	174	34 (28)	27	17	3	3	3	3	3	3	3
D6045	216	10 (7)	8	4	1	1	1	1	1	1	1
D6045	122	20 (23)	12	9	1	0	0	0	0	0	0
D6032	161	12 (18)	14	7	3	3	3	2	2	2	2
D6032	188	15 (11)	11	11	3	0	0	0	0	0	0
D6032	198	20 (14)	16	10	1	1	1	1	1	1	1
D6032	200	17 (12)	12	8	2	2	2	2	2	2	2
D6032	180	11 (8)	10	5	3	1	1	1	1	1	1
D6032	135	22 (23)	22	11	2	2	1	1	1	1	1
D5968	140	35 (36)	25	13	2	2	1	1	1	1	1
D5968	180	30 (24)	26	13	2	2	1	1	1	1	1
D6045	170	46 (39)	32	16	4	4	4	4	4	4	4
D6045	80	7 (13)	1	1	0	0	0	0	0	0	0
D6045	108	9 (12)	3	2	1	1	1	1	1	1	1
D6045 SLOI	78	8 (15)	2	1	0	0	0	0	0	0	0
D6045	128	12 (13)	7	3	2	2	2	2	2	2	2
D6045	47	6 (18)	3	2	2	2	2	2	2	2	2
D6045 SLOI	112	3 (4)	3	9	9	9	9	9	9	9	9
D6045	120	22 (33)	18	1	1	1	1	1	1	1	1
D6045 SLOI	100	11 (16)	2	8	8	8	8	8	8	8	8
D6045	78	15 (27)	16	1	1	1	1	1	1	1	1
D6045 SLOI	91	0	2	5	5	5	5	5	5	5	5
D6045	98	16 (23)	10	5	5	5	5	5	5	5	5
D6045 SLOI	104	16 (22)	10	4	4	4	4	4	4	4	4
D5968	128	24 (27)	8	4	4	4	4	4	4	4	4
D5968 SLOI	66	10 (22)	8	7	7	7	7	7	7	7	7
D5968	120	22 (33)	14	3	3	3	3	3	3	3	3
D5968 SLOI	95	13 (18)	6	10	10	10	10	10	10	10	10
D5968	98	17 (25)	20	6	6	6	6	6	6	6	6
D5968 SLOI	63	14 (22)	12	3	3	3	3	3	3	3	3
D	13	1 (11)	1	3	3	3	3	3	3	3	3
SLOI	63	8 (18)	4	3	3	3	3	3	3	3	3
D	108	4 (5)	4	3	3	3	3	3	3	3	3
SLOI	100	1 (1)	1	6	6	6	6	6	6	6	6
D	90	10 (18)	10	6	6	6	6	6	6	6	6
SLOI	110	13 (17)	13	1	1	1	1	1	1	1	1
D	90	10 (18)	10	9	9	9	9	9	9	9	9
SLOI	83	5 (9)	8	2	2	2	2	2	2	2	2
D	105	20 (27)	7	4	4	4	4	4	4	4	4
SLOI	78	7 (13)	7	9	9	9	9	9	9	9	9
D	88	7 (11)	7	10	10	10	10	10	10	10	10
SLOI	93	5 (14)	20	2	2	2	2	2	2	2	2
D	85	20 (33)	4	25	25	25	25	25	25	25	25
SLOI	77	4 (7)	4	2	2	2	2	2	2	2	2
	497	115 (19)	491	258							

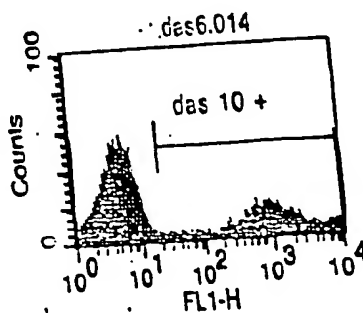
Summary	No of Pregnancies
Preg Status	9
> 40 d	2
> 60 d	4
> 120 d	3
> 180 d	3
> 210 d	3
Total	21

A
876
(Control)



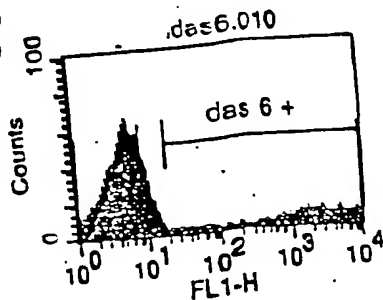
% Total
100.00
26.61 %

F



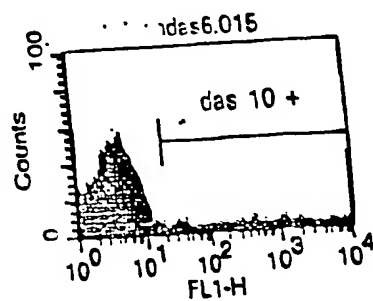
% Total
100.00
29.47 %

B
4904
(Control)



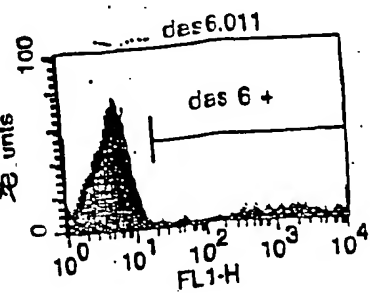
% Total
100.00
19.62 %

G



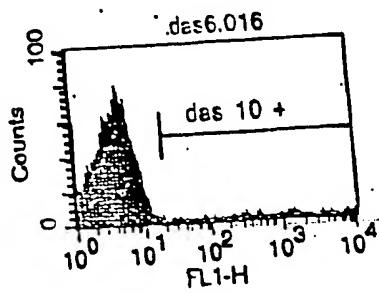
% Total
100.00
12.43 %

C
5961
experimental



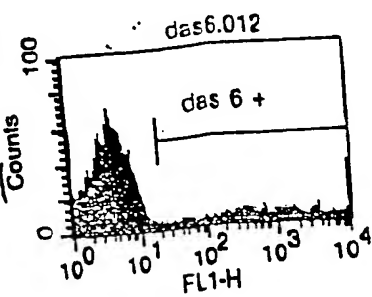
% Total
100.00
7.78 %

H



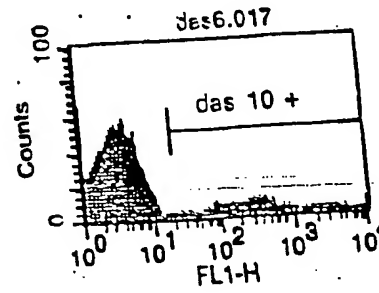
% Total
100.00
2.54 %

D
5971
experimental



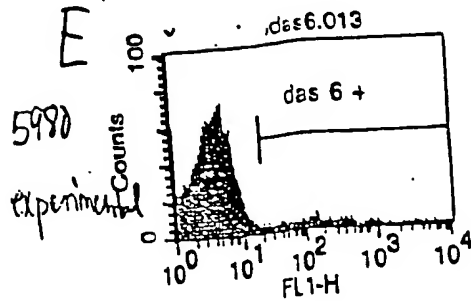
% Total
100.00
11.80 %

I



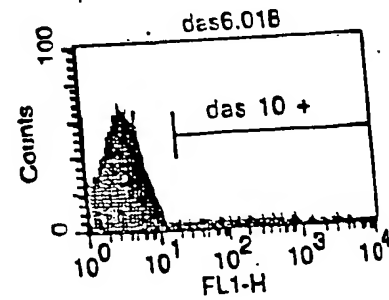
% Total
100.00
13.77 %

E



% Total
100.00
3.95 %

J



% Total
100.00
3.99 %

Figures 28A-28J

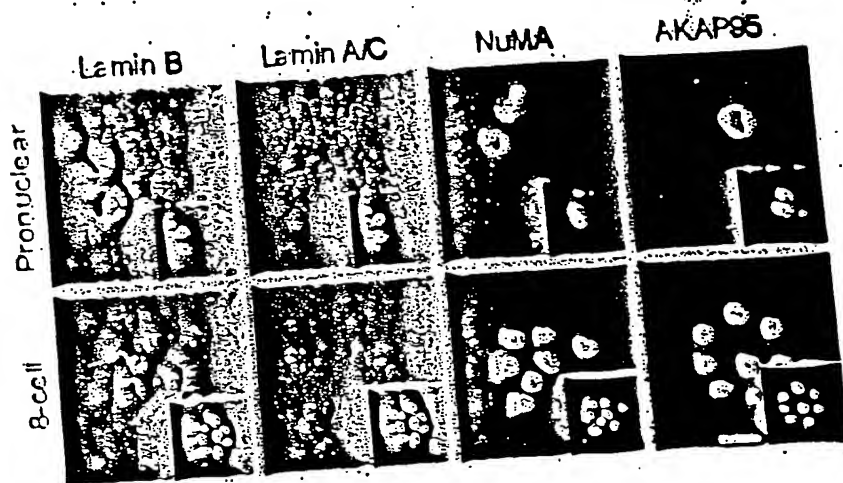


FIGURE 29A

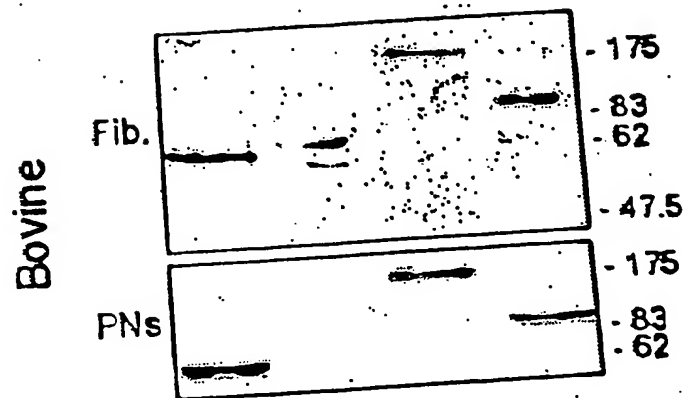


FIGURE 29B

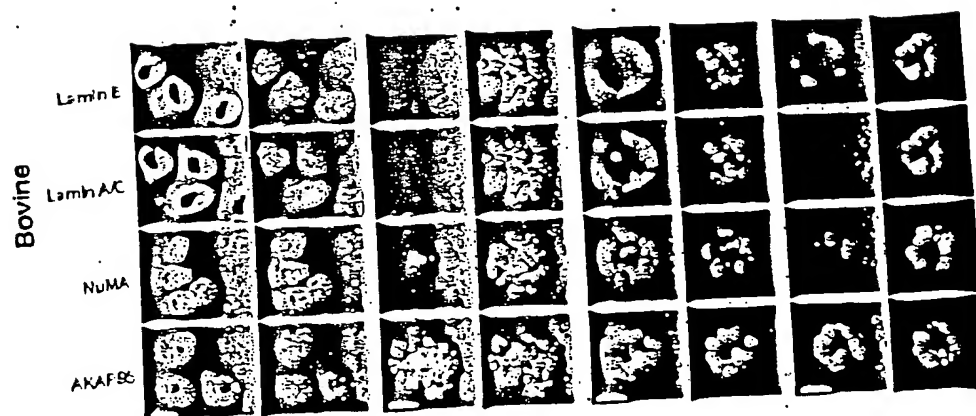


FIGURE 30

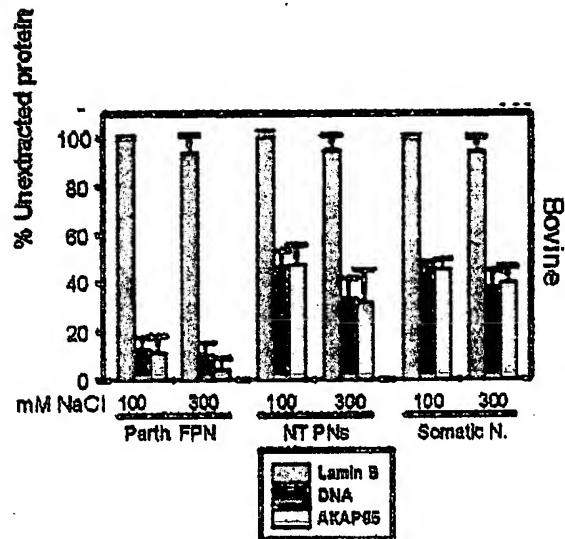


Figure 31

FIGURE 32

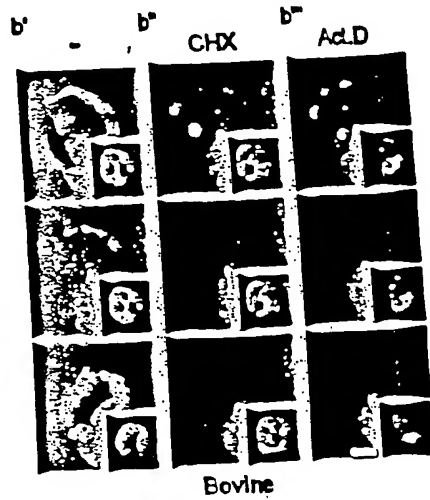
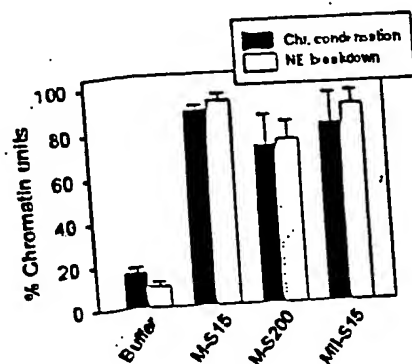
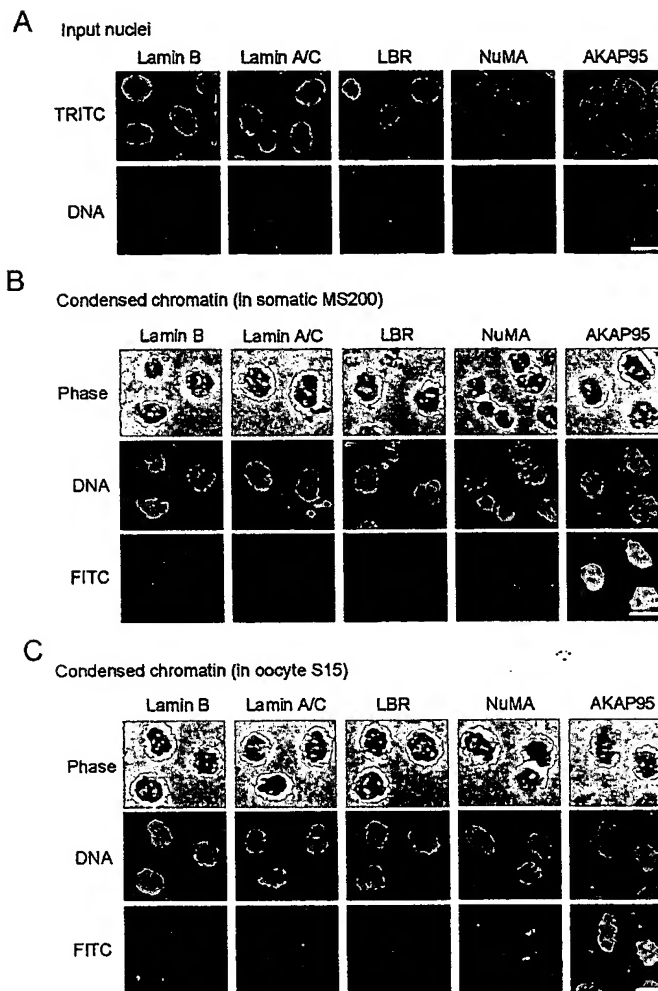


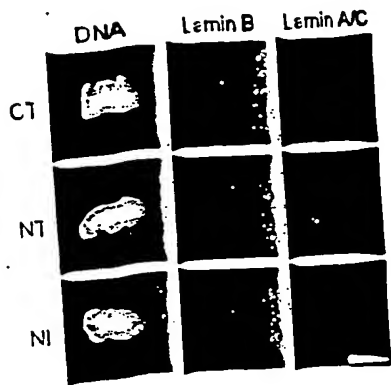
FIGURE 33

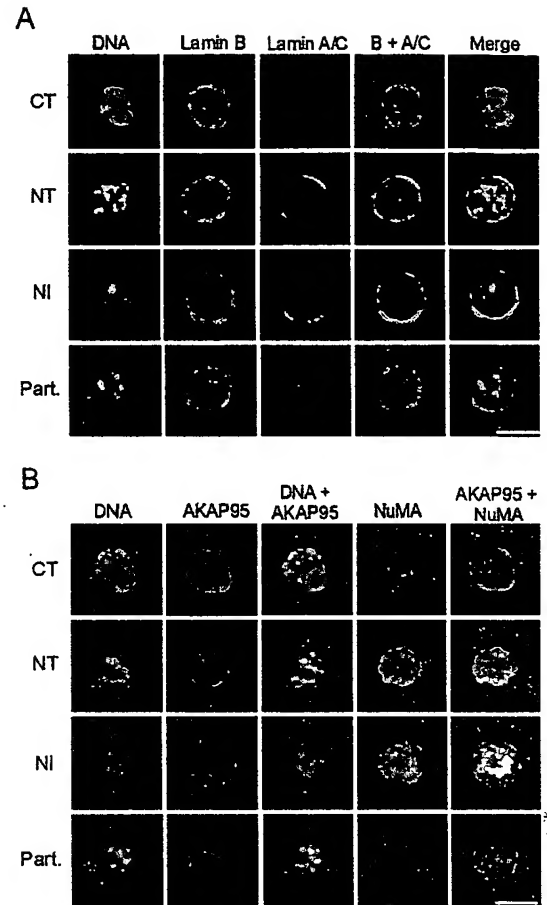




Figures 34A – 34C

FIGURE 35





Figures 36A and 36B

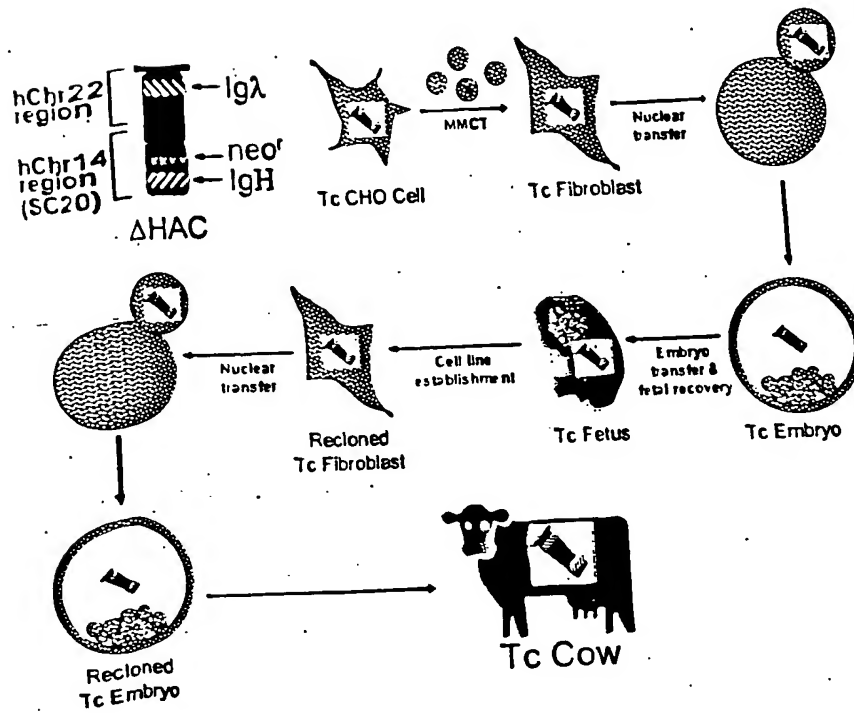


FIGURE 37



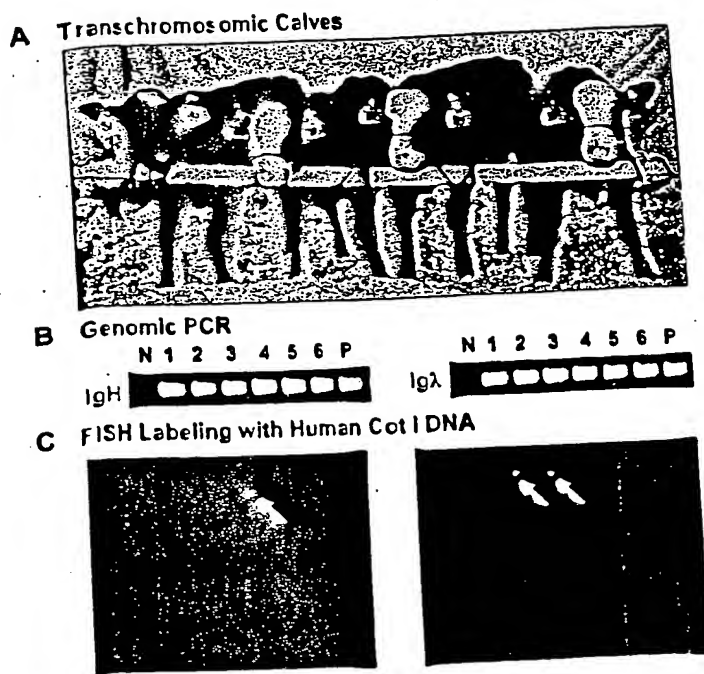
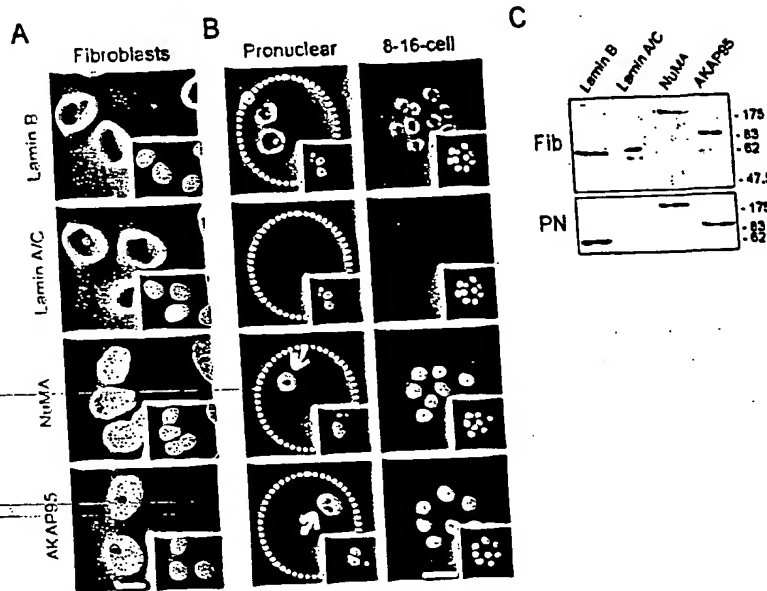
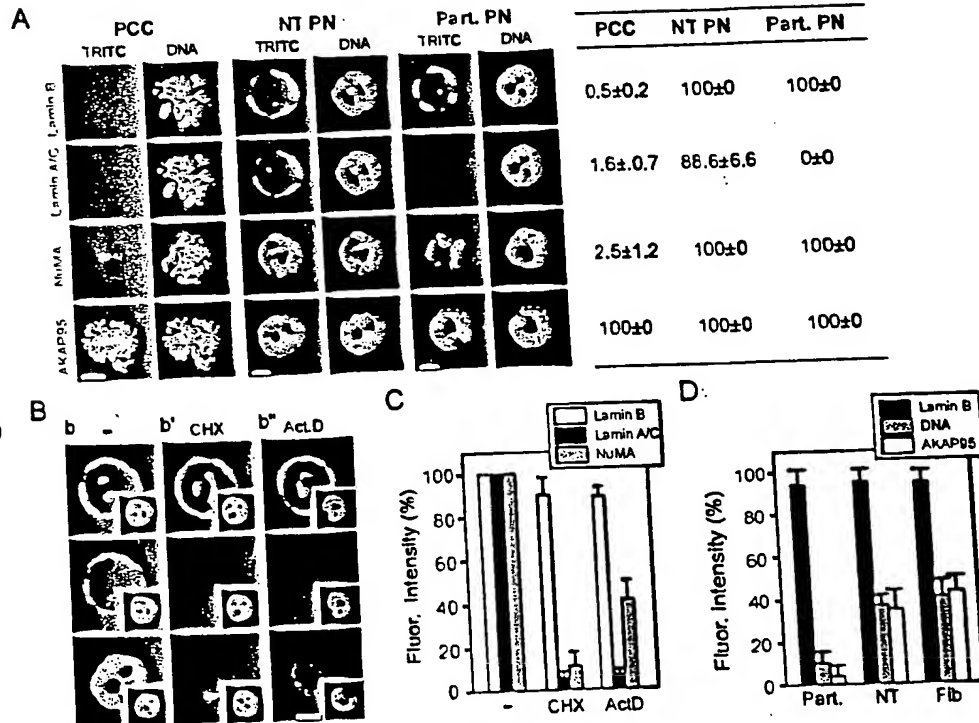


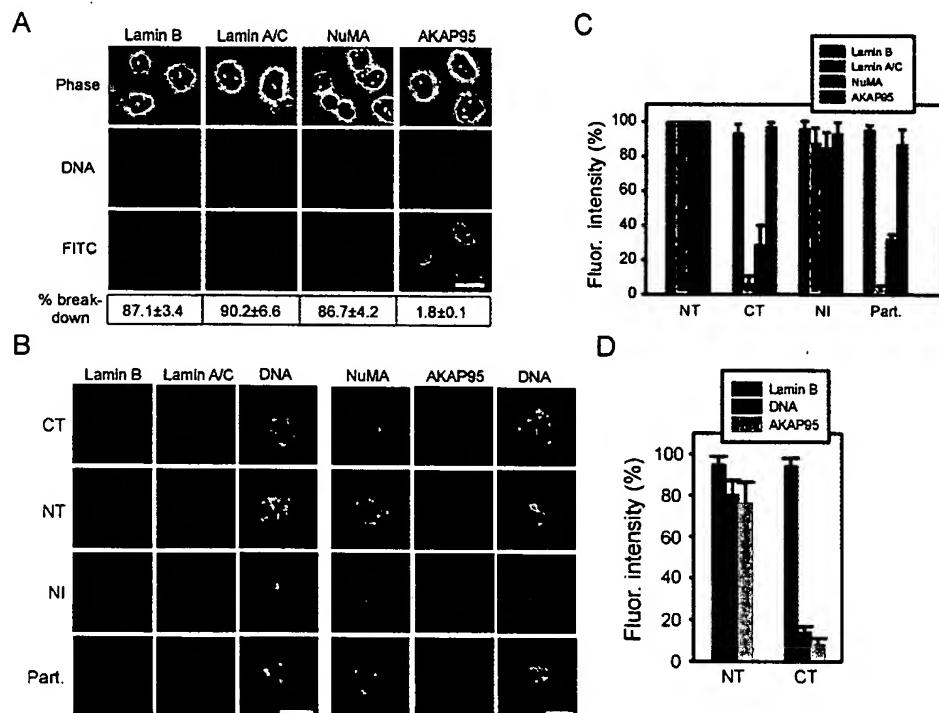
FIGURE 39 A-C

Figs. 40A-40C



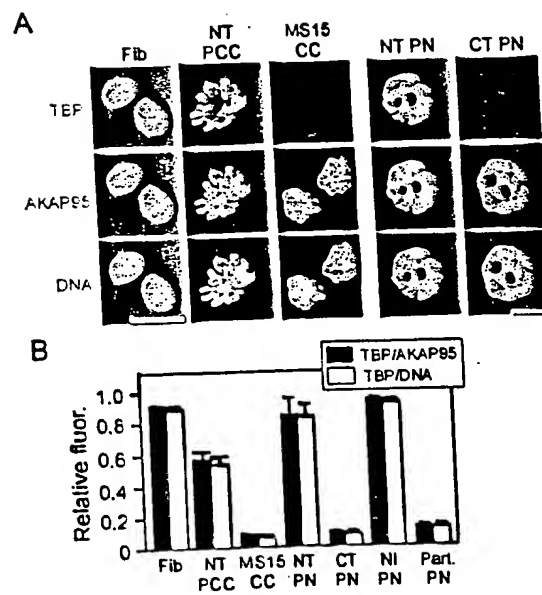
Figs. 41A-41D





Figs. 42A-42D

Figs. 43A and 43B



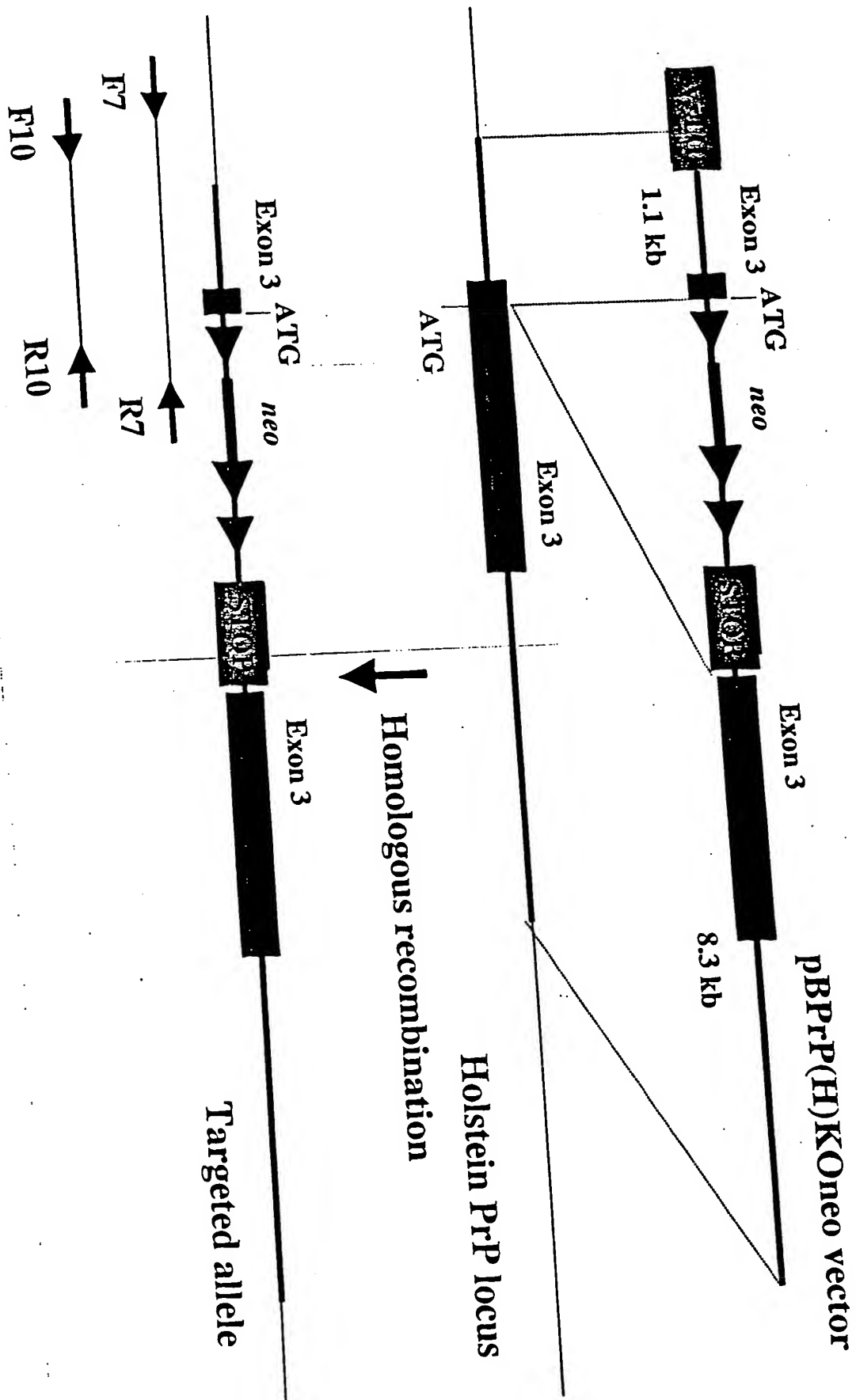


Fig. 44A

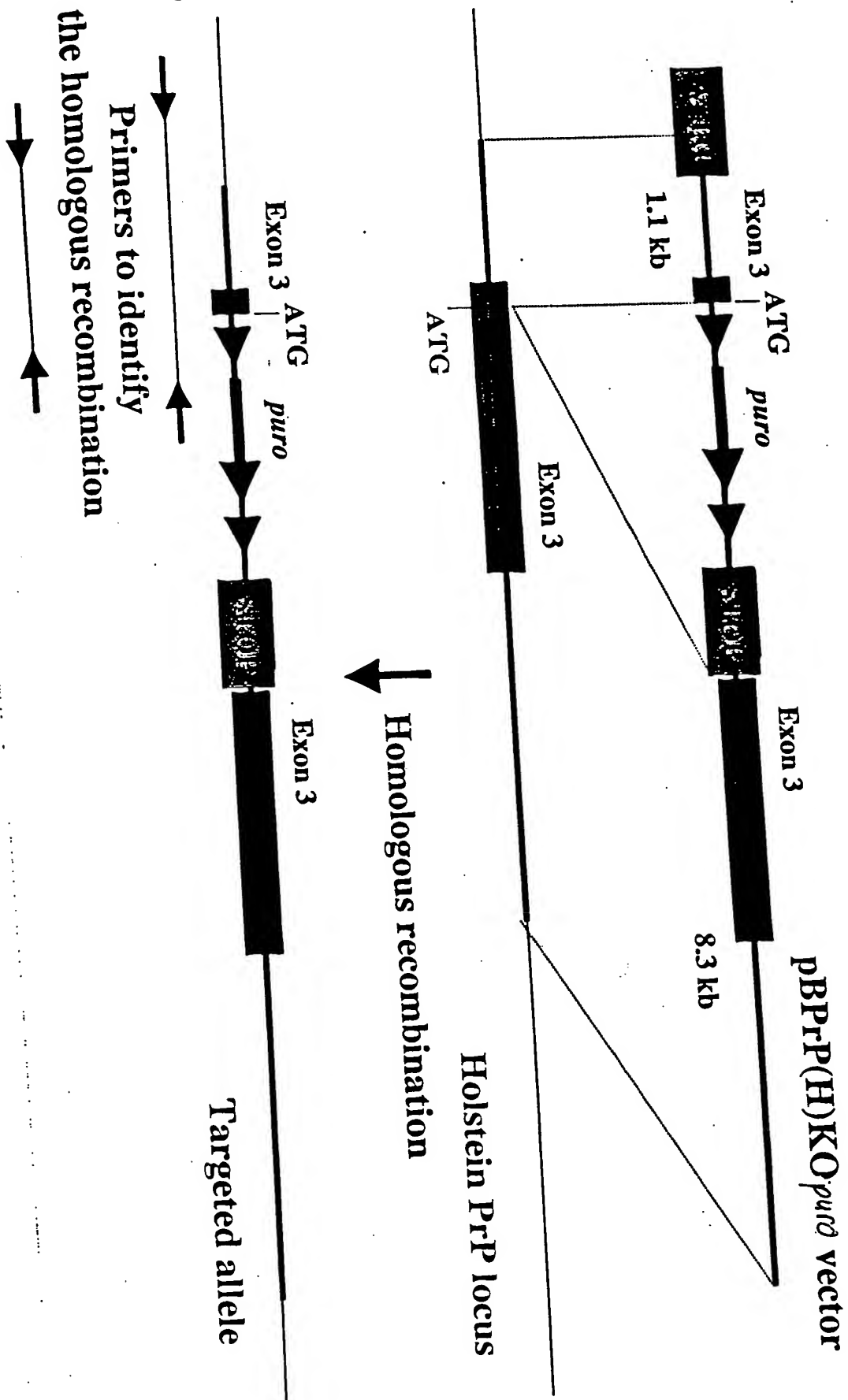
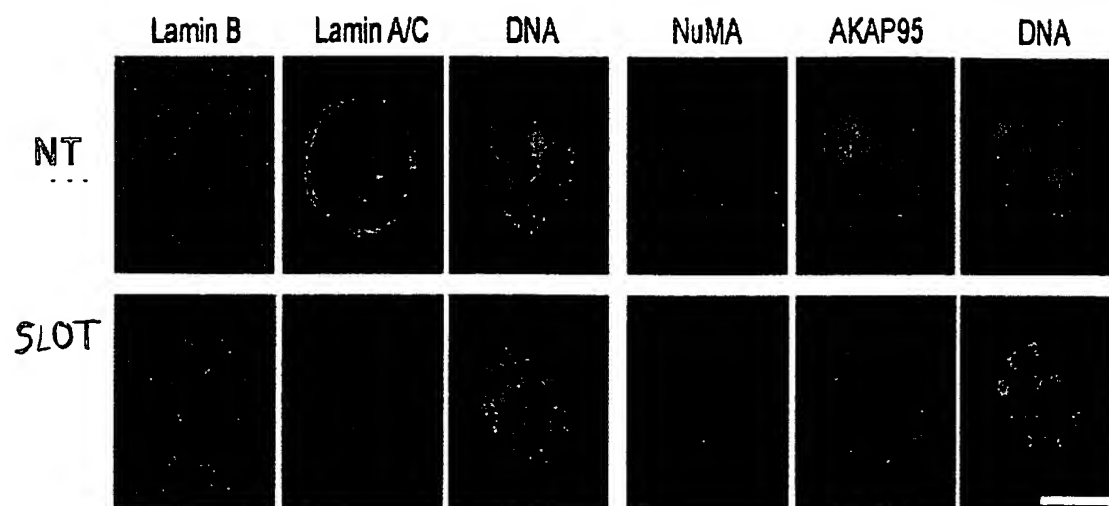


Fig. 44B

Cell line	No of screened clone	Primers F7 x R7	Primers F10 x R10	Frequency
Holstein	94	51	51	>50 %
Holstein x Jersey	141	75	75	>50 %

Fig. 44C

Figure 45A



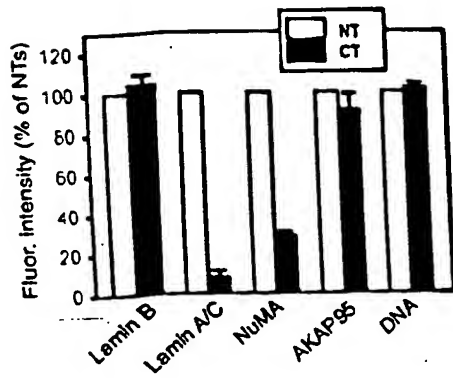
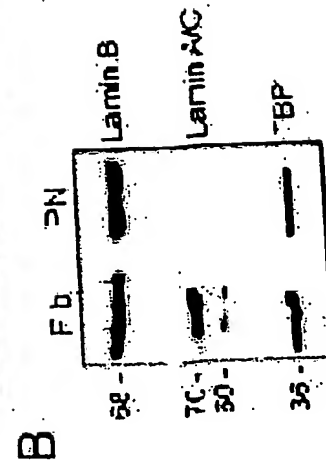
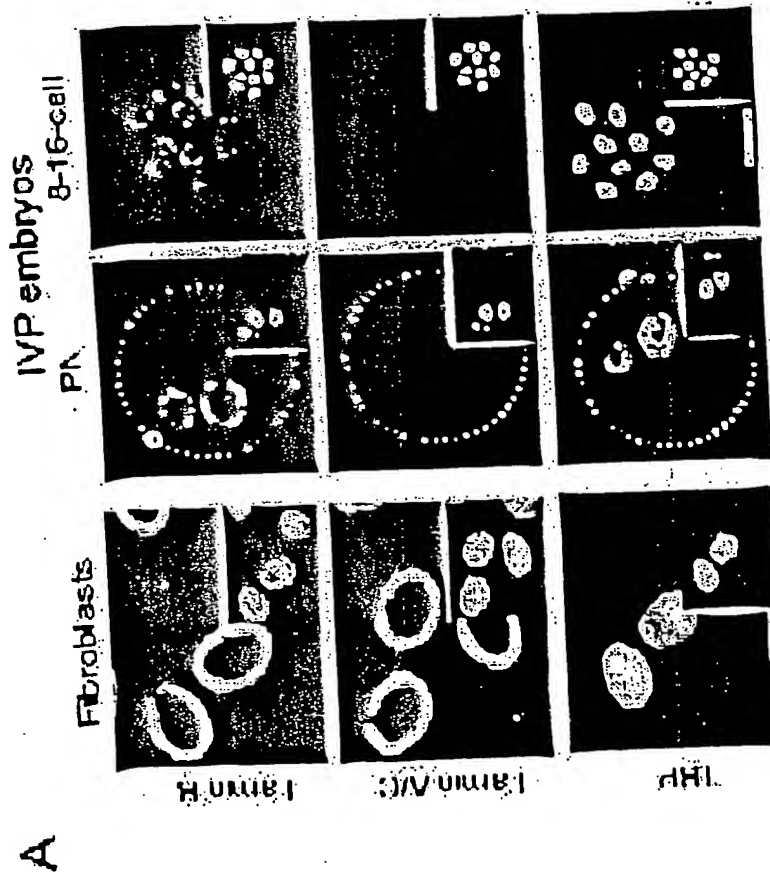
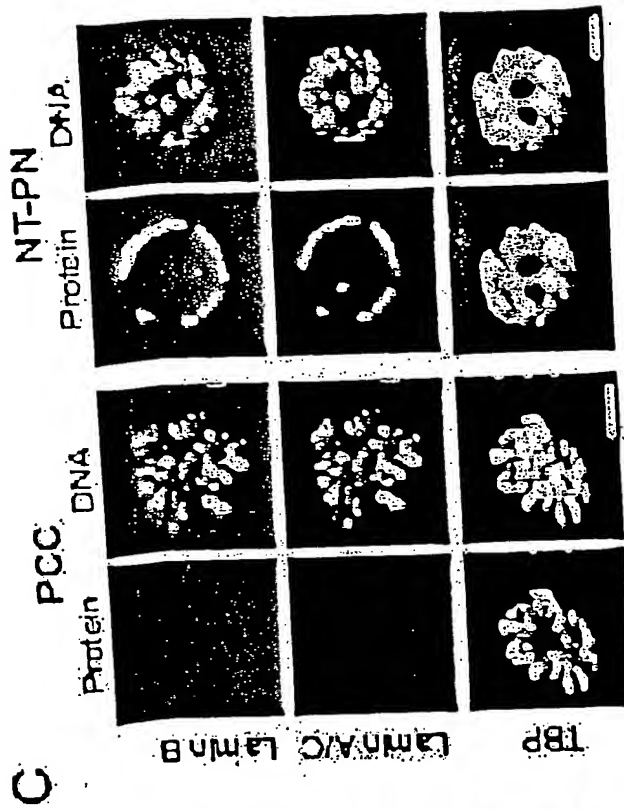


Figure 45B



Figures 46A-46C

46D

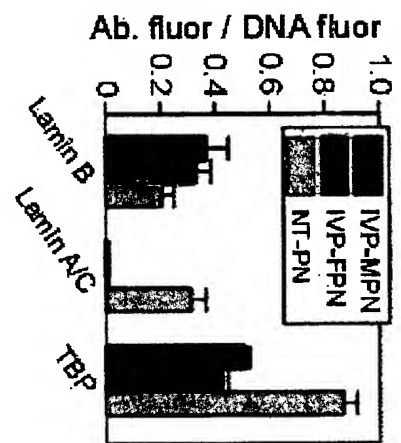
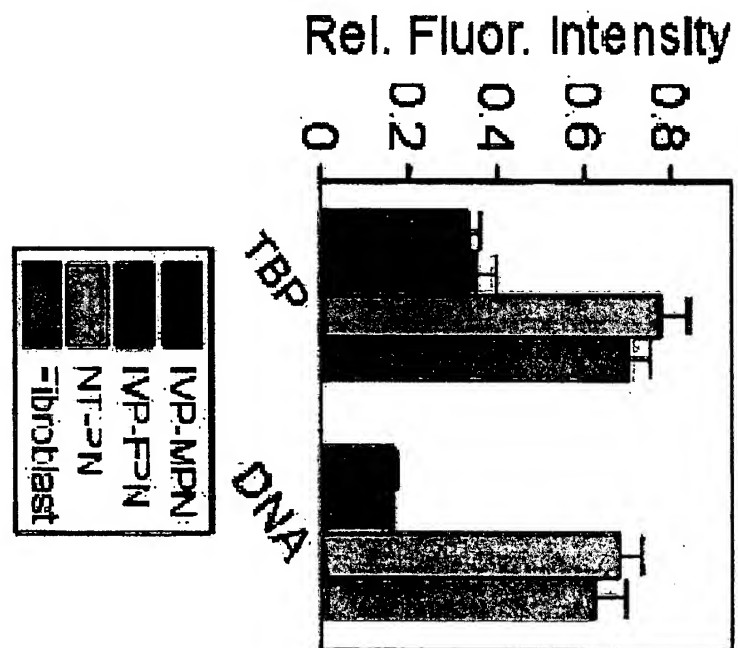


Figure 46D

Figure 47A



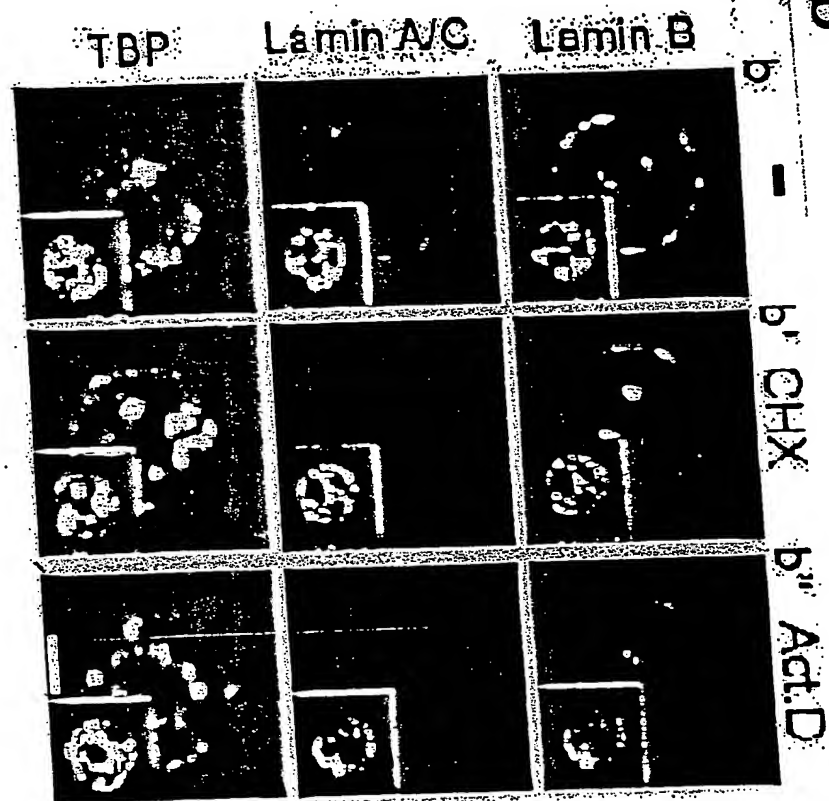


Figure 47B

47C

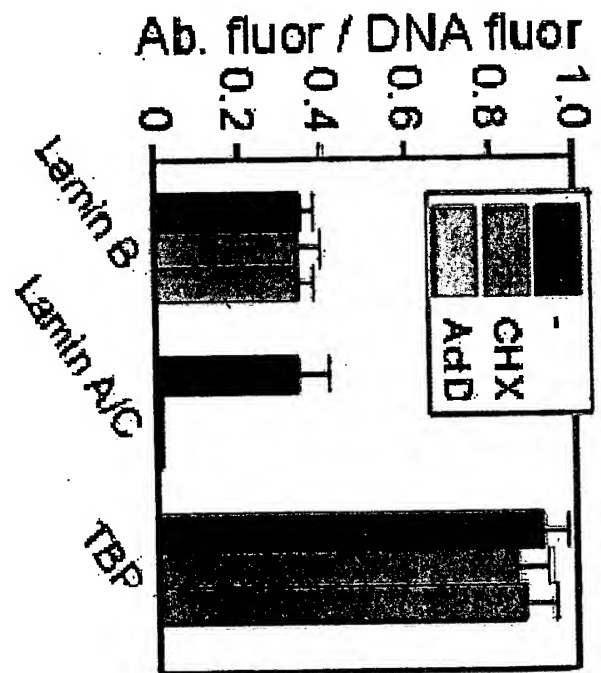


Figure 47C

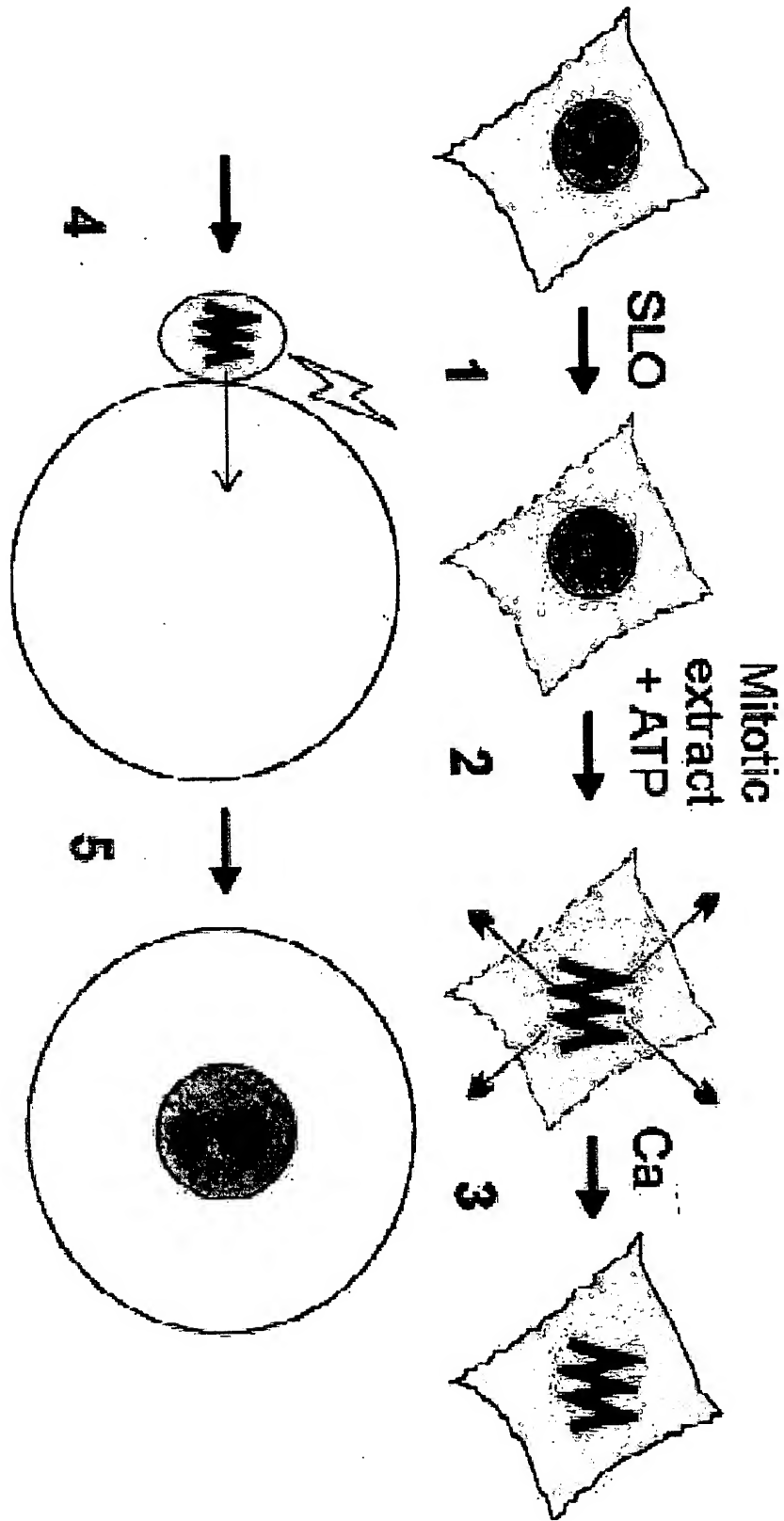


Figure 48

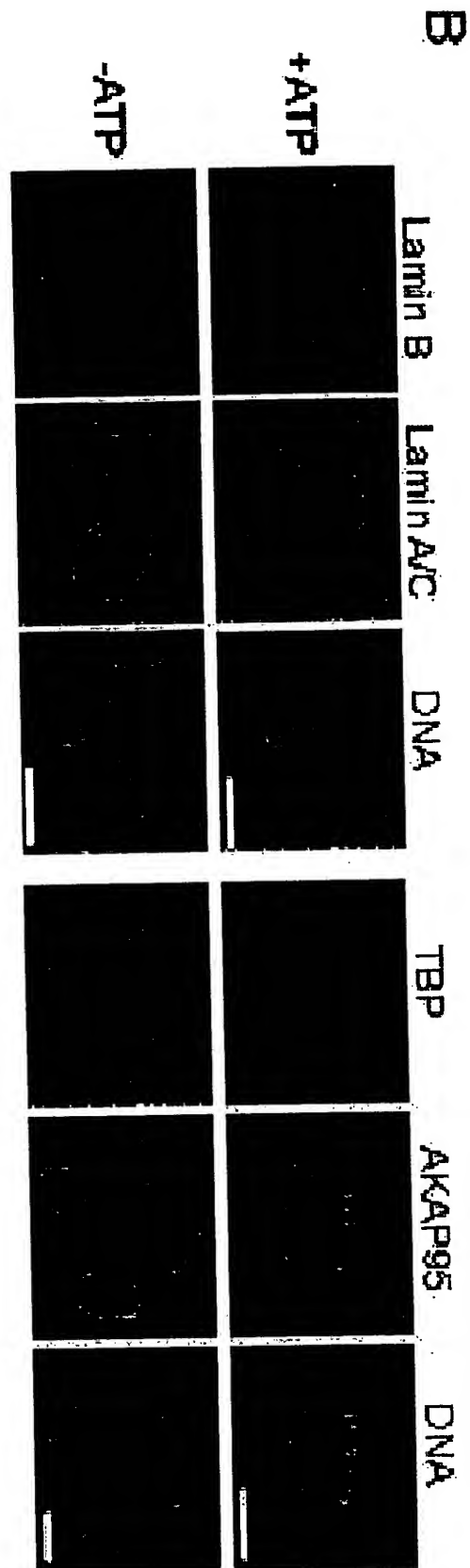


Figure 49

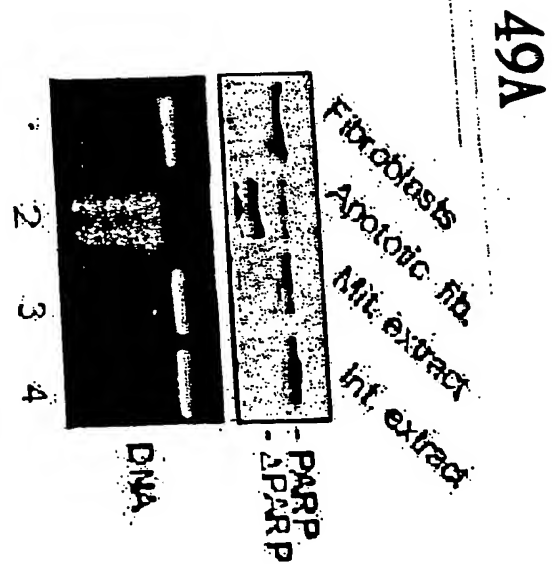


Figure 49A

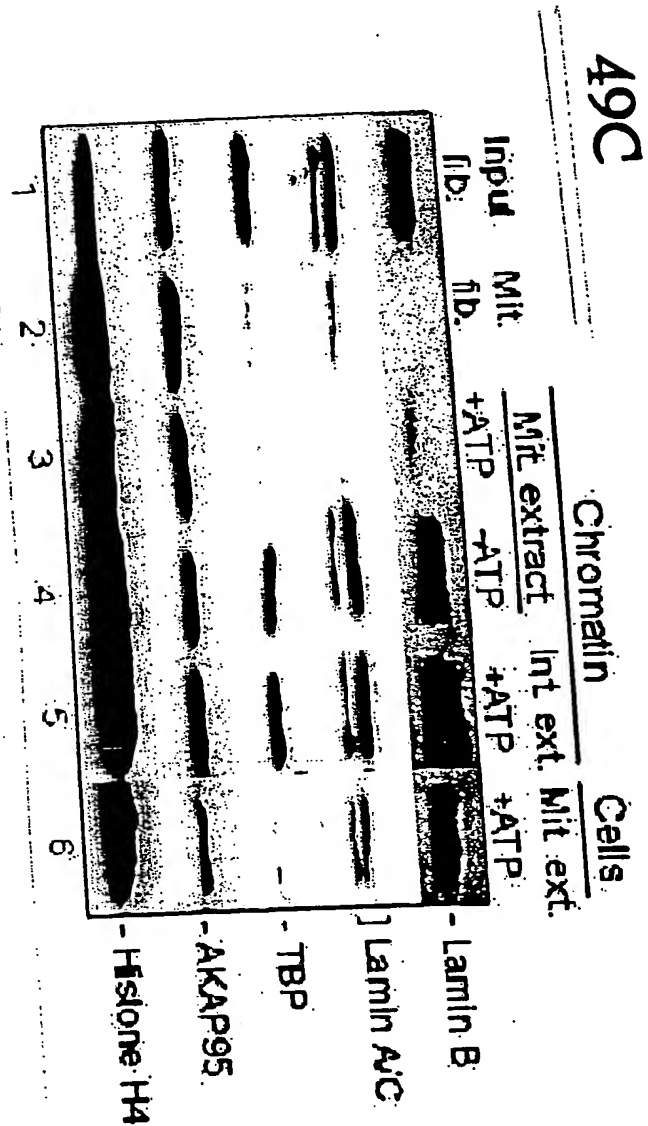
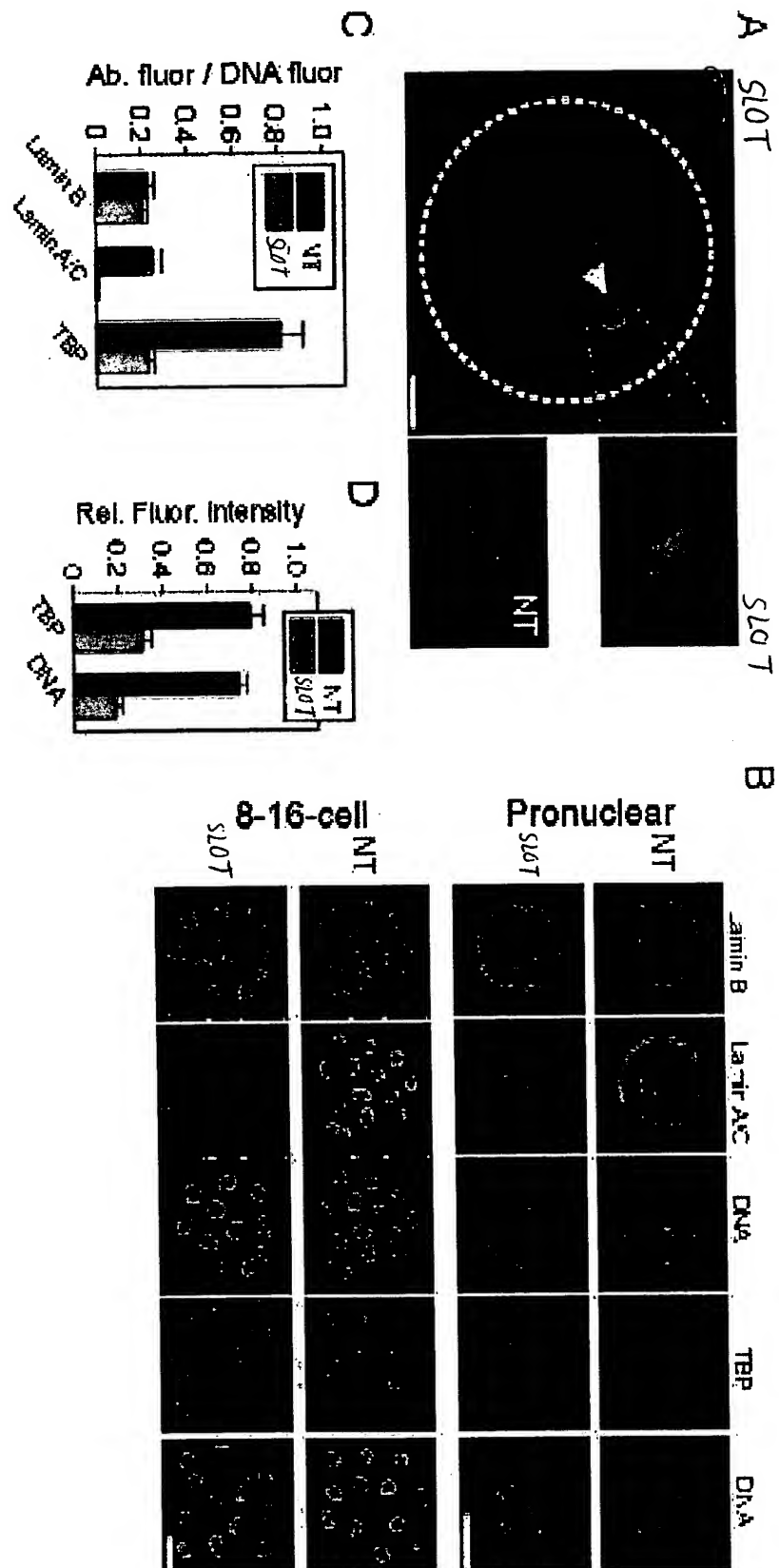


Figure 49C



Figures 50A-50D

51A

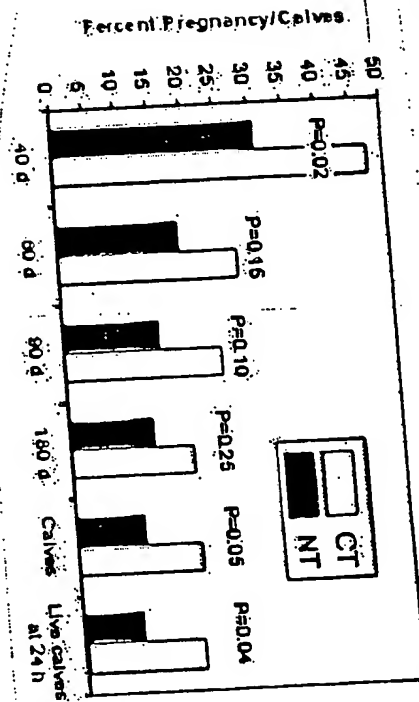


Figure 51A

Title: TRANSGENIC UNGULATES HAVING REDUCED
PRION PROTEIN ACTIVITY AND USES THEREOF

Applicant(s): James M. Robl et al.

Filing Date: November 10, 2003

Serial No.: N/A

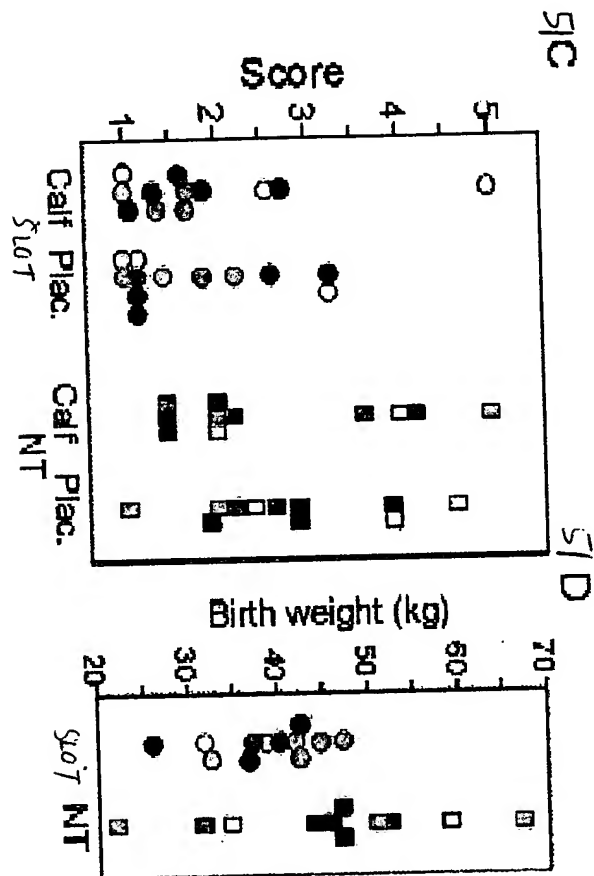
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Customer No.: 21559

51B



Figure 51B



Figures 51C-51D

Figure 51E

